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THE PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

PROCEEDINGS AND PAPERS

OF

THE NINTH ANNUAL MEETING

HELD AT

PITTSBURGH, FEBRUARY 5-6, 1908

Proceedings and Papers of

Ninth Annual Meeting

of the

Pennsylvania Live Stock Breeders' Association

Held at

Pittsburgh, February 5-6, 1908

OFFICERS

President, - - - - W. C. NORTON, Aldenville
First Vice-President, DR. LEONARD PEARSON, Philadelphia
Second Vice-President, - M. P. SHOEMAKER, Greensburg
Secretary, - - - E. S. BAYARD, East End, Pittsburgh
Treasurer, - - - - J. F. LANTZ, Wyebrooke

ACKNOWLEDGMENT.

The Pennsylvania Live Stock Breeders' Association desires to acknowledge the kindness of the following, who have donated Cups for its Third Annual Corn Show:

Dr. Thos. Tumbull, Jr.....Pittsburgh, Pa.
Penn'a Agricultural College Instructors.....State College, Pa.
Faculty of the Veterinary College of the University of Pennsylvania, Philadelphia, Pa.
The Department of Agriculture..... Harrisburg, Pa.
Hon. Vance C. McCormick.....Harrisburg, Pa.
R. T. Shannon, Esq..... Pittsburgh, Pa.
The American Agriculturalist.....New York, N. Y.
The National Stockman and Farmer.....Pittsburgh, Pa.

Also the following, who donated prizes to the Second Annual Corn Show at Pittsburgh, February 5-6, 1908:

Dr. Thomas Tumbull, Jr.....Pittsburgh, Pa.
Oliver Chilled Plow Works.....South Bend, Ind.
American Fork & Hoe Co.....Cleveland, O.
Frank N. Champe.....Cambridge City, Ind.

We desire to thank, also, the kindness of the press in publishing our notices, and all our friends everywhere for their co-operation.

PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

PROCEEDINGS OF THE NINTH ANNUAL MEETING

HELD AT

PITTSBURGH, PA., FEBRUARY 5-6, 1908

WEDNESDAY, FEBRUARY 5, 9:30 A. M.

President Norton in the Chair.

The President: The meeting will please come to order. The first thing on the program will be the reports of officers. Have you anything to say, Mr. Bayard?

Mr. Bayard: I don't think I have anything to say except what is in the report of last year. We have about two thousand copies of this report, and you can take as many of them as you want.

Our corn show is better than I anticipated. Everybody who grows it knows what this last year has been for corn, and I am glad to see this exhibit looking so much better than any of us expected.

The Association is in good shape. I think I should say right here that the Department of Agriculture, through Secretary Critchfield, has helped us in every way possible, and we have in turn helped it. The Secretary is here now, and I suggest that we ask him to make an address. Last year we also had the pleasure of having him with us. We held our meeting in conjunction with the State Board of Agriculture, at which he presided. Let us hear from you, Mr. Critchfield.

Secretary Critchfield: I don't think I have any report to make. I know we all had a very good time last year. I was surprised beyond my power to express at the corn exhibition we had, and the general interest and good feeling manifested throughout the sessions, and I believe that we not only had a good time, but that a great deal of good was done by the dissemination of agricultural knowledge. I hope that before the close of this session we may be able to make some arrangement whereby we can all meet together again next year. It is a little difficult to find a room large enough to fill the requirements of such a meeting. We found a room last year, but I don't know whether we will be able to get it again next year; still, I have no doubt we can find a room that will accommodate us all and I do not see why we should not get together again, and be mutually helpful to each other.

I am in full accord with the views expressed by your Secretary, that the State Live Stock Association should prove helpful to the Department of Agriculture. I consider this Association one of the mainstays on which the Department can lean. A number of times I have had occasion to write to your Secretary for information, and I have always received prompt replies, and help that has been readily given.

I am glad to be with you, and hope to meet you all again next year at a joint meeting of your Association and the State Board of Agriculture.

The President: Is the Treasurer ready to make his report?

The Treasurer: My report will be very brief: the last meeting left us with a

Balance on hand of	$ 83.16
Receipts during the year	746.22
Total	$829.38
Expenditures	482.73
Leaving balance of	$346.65
To which must be added amount received from Mr. Bayard since making up the report	32.25
Making net balance on hand	$378.90

I would just like to add that I have the Breeders' Association badges here. They are very catchy, and I will be here at the desk, and will be much pleased to have the members and others who are with us, come forward and receive them, and pay their annual dues. We may need them before the session is over.

The President: We need the dollars more than they do the badges.

The Secretary: I want to say that that report looks better than it really is. The bills are not all in yet. I tried to get them in in time for Mr. Lantz to prepare his statement, but did not succeed in doing so. They will soon be in now, and then the report, I am sorry to say, won't look quite as good as it appears here.

The President: Gentlemen, we should like you all to become members. We want to help the live stock breeders of the State. We want to advance the interests not only of the Live Stock Breeders' Association, but of the agriculture of the state generally. So far as I am concerned, personally, I am

heartily in sympathy with the work of agriculture through the Department of Agriculture, and also with the work of State College. We are all united, and if we hold together we can accomplish something, but if divided, we will not do much.

As far as the President's address is concerned, I have been President for so many years that I think we will all agree to cut that out. Most of you know that I am in hearty sympathy with the work of the Breeders' Association, and also with agriculture.

Are there any reports of Committees? I was Chairman of the Legislative Committee, and also of the State Fair Committee, and I will make my report later, when we can renew the questions, and then I should like to hear from you in regard to them.

Is there any miscellaneous business?

The Secretary: I don't think there is anything special.

The President: The appointment of the Committees I will make a little later, before the opening of the session this afternoon. We will now take up the program. The first thing on the program is an address by C. L. Taggart, on "How the Champion Carcass Was Made." I have the pleasure of introducing to you Mr. Taggart.

HOW THE CHAMPION CARCASS WAS MADE

By. C. L. Taggart, Washington, Pa.

During the short time that I was feeding and caring for the steer "Squire Good," that was the Grand Champion carcass at the last International Exposition, there were some things that naturally came to my mind with regard to where this steer would stand in a show where such a large crowd of the best cattle of all the best breeds of both Canada and the United States would be found. But there was one thought that did not occur to me, and that was, should I win, I would be asked by the Pennsylvania Live Stock Breeders' Association to give an account of how it was done. And I certainly consider it an honor to be asked by this Association to do so. As this was the first Champion Steer that Pennsylvania ever sent to the International Exposition, and as you are all trying to breed the best stock you can, I hope that what I may say will be of interest to you.

While I will try to give a short account of how this champion was made, do not understand that I am laying down rules to go by for making champions, for the feed and care you give one animal will not likely be exactly right for any other. I think it necessary that some facts should be given concerning the price paid, the premium won, and some statements from the judge, and also the butchers who bought the carcass, so as to make it clear to every one that "Squire Good" did not win the double ribbons because of any mistake of the judge, or by any game of chance, but won them because he was the best.

This carcass was sold at auction for 17½c per pound, or $128.21 for the carcass, and won $210 in premiums. There were thirty-one head in the contest, all older than he. The price per pound paid for the carcass was 5½c higher than any other carcass in the contest sold for, and 2½c higher than the champion carcass in 1906 sold for. The champion carcass of 1906 and 1907 were both judged by the same judge, and sold to the same butchers. The judge pronounced the 1907 carcass one of the best he had ever seen. The butchers who bought it said that they paid the highest price for it that they ever paid for beef in their experience of twenty years. All this is certainly evidence enough to prove that Pennsylvania can, and has, produced just as good beef as any that was ever sold at auction at any International show at Chicago, and on making inquiry of one that should know I have not found any one that has any record of one selling for as much per pou

With regard to the breeding of this steer I will say that he was practically a pure bred Angus, but was not eligible to registration, because I did not have registry papers of his dam. His sire is a bull of over a ton in weight and is a son of "Valiant Knight 2nd," a champion of three International shows. "Squire Good" was calved July 23rd, 1906. When he was about four or five weeks old I decided that he was as near a perfect calf as any I had ever seen, and if he was properly fed and cared for he ought to be a winner some day. He was let run in the field with his dam until November 1st. He was then brought into the barn every night, and given a few handfuls of corn, oats and bran, and a little clover hay. He was a little shy at first, but soon became very gentle. On November 29th he weighed 350 pounds. After that he was kept in the barn at night and ran in the open barn shed and small yard in the day time. He did not run with his dam, but she was let in with him morning and evening. He did not have a nurse cow.

His feed was gradually increased from this on till spring, from two pounds a day to about seven pounds. On April 19th he weighed 700 pounds, having made an average gain of 2½ pounds a day since November 29th. He was always weighed in the morning without hay or water. His feed during this period was principally equal parts of ground corn, oats and bran, with a small quantity of oil meal and a few pounds of roots. The last month he was fed before being let out to grass, he made a gain of three pounds a day. When the grass was well started, he was let out in the field for half a day or so at a time. About the middle of May he was weaned and turned into a field of good blue grass, and was then fed a light feed twice a day of corn, oats and bran. As there was a great deal of rain last summer, the grass did not seem to be so good for fattening as usual, and he did not gain quite as fast as I expected he would. He was not in the stable again until August 1st. He was then taken from the pasture and put in a shed 20x40, where there was running water all the time. He was not tied, because I think an animal can rest much better when loose. After he was shut up I fed him three times a day, on the same kind of feed that he got in the winter, except that new corn was added in September. The ground feed was gradually diminished and the new corn increased until he was eating nearly half a bushel of ear corn a day. For several weeks before the show he was fed four times a day. The feed was changed frequently, in order to keep him from tiring of his feed, and to keep his appetite good. If he did not clean his food up I did not give him quite so much the next time. I did not keep salt in front of him all the time, but gave him nearly all he wanted every day. After he was shut up he never missed a feed, and was fed at regular hours as near as possible. I did not use the brush much except on wet days, until several weeks before the show, and I think it was time well spent. When he left my place in November he was sixteen months old and weighed 1,150 pounds.

As I have been studying the beef question pretty closely for some time back, there are several things that seem plain to me, and these are: If we expect to raise prize beef, we must raise the kind that pleases the butchers and the consumers. They are usually ready to pay a good price for the kind they can get the most meat out of, and this kind will, of course, make the most profitable kind for the producer. There may have been a time when the carcass with great rolls of waste fat on it was at a premium, but that time is past; and I think that some statements that I have from butchers that bought the champion carcass will bear this out, for they said that the very fat carcasses in the contest were the ones that sold for the least money, and some were so fat that they would not even bid on them.

As Pennsylvania produced her first champion wether carcass last year, and her first champion steer carcass this year, it is evident that we do not have to be in the great corn belt to produce champions. But location and feed are not the only factors to be considered; for if we expect to win we must have a good individual and good blood.

The President: This paper is now open for discussion, and Mr. Taggart will no doubt readily answer any questions.

The Secretary: I would like to ask Mr. Taggart what he meant by "Pennsylvania's champion mutton carcass last year?"

Mr. Taggart: It was the one that Mr. Henderson produced.

The Secretary: Henderson, stand up, so that we can see you, and tell us all about it.

Mr. Henderson: That wether was champion in his class. The grand champion carcass was a lamb last year.

Mr. Lamont: Will Mr. Taggart please tell us the age?

Mr. Taggart: He was sixteen months old.

Mr. Lamont: I told a man this morning he was nineteen; I was not sure.

Mr. Lamont: Will Mr. Taggart please give us the weight? We represent the same county, so you will not think my questions strange.

Mr. Taggart: He weighed the day he was shipped 1,150 pounds.

A Member: I would like to ask Mr. Taggart whether he took particular pains to figure out a balanced ration for him when he was fed?

Mr. Taggart: I have been studying the question of feeding for some time, and I picked out what I thought was as near as I could get to it.

A Member: In actual figures?

Mr. Taggart: Yes, sir.

Mr. Bayard: In what proportion was the oats and hay and corn? Did you give it by measure or by weight?

Mr. Taggart: By measure.

Mr. Norton: According to that, he was fed a good deal of protein. Any more questions? I want you to wake up, gentlemen. We always had a live meeting, and I don't want a dead one this year. We got these gentlemen here to answer questions, and I don't want you to be afraid to ask them.

Mr. Clark: Would a breeder in Western Pennsylvania be able to compete in the market with the Western cattle?

Mr. Taggart: I don't think he could.

Mr. Critchfield: The paper read by Mr. Taggart brings out one very important fact that I think we should all remember. It is that if your breeders and feeders of live stock expect to do their best, they want to get their stock into the market as early as possible. Here was a steer that was a little over a year old, and weighed 1150 pounds. I suppose that calf, although he says he was strong, and a perfect calf, did not weigh over a hundred pounds, to begin with. Then there must have been a thousand pounds put on him. If he had fed that steer a second year, the probability is that he would not have added more than four hundred pounds to it, and it would have required more to feed him the second year than it did the first, and more to keep him the third year than it did the second, while he gained even less weight the third year than he did the second. So, in order to get the best results, we want to get our cattle ready for the market just as early as possible.

The President: I think there was some one else wanted to ask a question.

A Member: What was the dressed weight?

Mr. Taggart: 691 pounds, whole weight.

The President: Anything more? If not, we will take up the next subject on the program, an address on "Flock Management" by Dick Stone, of Stonington, Ill. I am pleased to introduce to you Mr. Stone.

Mr. Stone: Mr. President, when I received the announcement from your Secretary that he wished me to come here, I wondered what ever it was for. I supposed he had found out that I had married a Pennsylvania girl, and he wanted to find out what a mistake she made when she went West. This is the mistake.

When I saw the name of Norton as President of this Association, I thought "How the cream will always rise to the top!" This gentleman and I have been acquainted for a good many years. I have known him under almost every circumstance that was possible, and I have always found him a gentleman, and I think you gentlemen of Pennsylvania have also found him so. I think he is the right man in the right place, and if I were you, I would try to keep him there. He has been with us in the West, and he has showed us what it is possible for Pennsylvania to do.

When you farmers and breeders here in Pennsylvania want to do a thing of any particular importance, you simply do it, and think it is a very great thing, even though you have not had any encouragement. But it is well to remember that you want to go before your Legislature and ask them to back you up in your efforts, but you must remember first of all, in doing that that the men who are in the Legislature are voted there. You must vote for them before they vote for you, and you can give a man almost everything, but you can't feed him, except from the soil, so look who you are voting for. I am glad to see that the breeders and farmers are acting in harmony in this, and if you keep at it long enough there is little doubt but that you will get all you want.

The subject you people have given me is "Flock Management," but I give it the name of "The Shepherd Among His Flocks." I will read you a little paper this morning. My wife and I got it up; she did the most of it, so it is really a Pennsylvania production. Your Secretary—where is he? Just behind me, when I want to talk to him. This paper is merely a skeleton, and I want you to ask questions. If there is any man on earth who can answer questions I am the one. That is where I shine. I won't promise you that I will always answer them correctly, but I will answer them. I will now spring this little paper on you. I have to use a paper, because once I begin, I never know where to stop, but when I have a paper, and get to the end of it, I stop. I have to put on my spectacles, because my eyes are getting too young. The great thing at these meetings is not what they hear from the speaker, but what they get afterwards in the discussion, so let us have an old-fashioned Methodist meeting, and ask questions, and tell our experiences. Now, then, for the paper.

THE SHEPHERD AND HIS FLOCK

By Dick Stone

Down through the historical record of mankind from the day of the first Shepherd of the first family, Abel, the Shepherds or Flock Masters have ever been considered the highest type of moral and Christian manhood. Science proves that almost the total character of man is influenced and developed by his surroundings and his associations. Science also proves that certain character traits are greatly influenced by man's constant care of certain domestic animals. Therefore the boy or man who takes an interest in the care of flocks will develop character traits that will prove an honor and a blessing through the years of his life.

Kindness, gentleness and patience are the great elements of the true shepherd's makeup. To the word patience we will also add the term persistence. It is the man with the iron will, with dogged determination who is to succeed in this age of sheep keeping. Our reverses and set-backs should never discourage us but instead guide us to a greater endeavor. The "sticker" is truly the winner in this as in every other undertaking. The brutal man, the individual who has only a curse and a blow for each dumb brute under his care should never venture into sheep keeping. The sheep is an extremely nervous and tender animal and therefore cannot withstand excitement and rough usage. With quiet handling the flock will thrive.

The sheep have often been termed the Golden Hoofs, in England they are termed the rent payers, in fact the sheep gives the quickest money returns and the greatest dividends, considering capital involved, of any of our domestic creatures.

Wool, Lambs and Mutton are the commercial products of the flock. This is not mentioning the valuable fertilizer produced by the sheep which is returned to the soil. The flock also helps to enrich its owner by keeping his premises free from foul weeds. There is scarcely a variety of weed the sheep will not consume, and for cleaning up foul pastures and fields they are invaluable. The sheep is certainly a sound financial proposition to any farmer or stockman and will always do its share at mortgage lifting.

A great fault with many people is to rush into the purchase of stock before they have provided any protection or fencing. It is foolhardy and crude to expect sheep to thrive with only the lee side of a barb wire fence for protection from winter blasts and driving storms. Provide a shed for them. A shed 16 by 24 will house nicely from 25 to 30 sheep. The house or shed should be located upon high dry ground and use "Mother Earth" to constitute the floor. Such a floor well bedded with dry straw is ideal for sheep. The sides under the eaves need not be over 4 feet in height and make it 10 feet at the ridge. Provide a good sound roof for a leaky covering is a source of much discomfort to sheep. The shed should be well lighted by glazed windows at each end of the building. These can be open in close weather to allow ventilation. The windows should be placed high enough so no draught will strike the sheep.

The pasture should be changed often for placing the flock upon fresh pasture at short intervals tends to keep the pasture free from parasites. It is a wise plan to provide two or more pastures and use these pastures alternately for sheep and cattle or sheep and horses. For the pasture you should select high, dry and slightly rolling land, and it should contain a liberal supply of shade trees. Shade is a necessity for the flock during the heated term of the summer; if possible have some running water. After horses and cattle have grazed a pasture over for a few weeks it will be again safe for the sheep. Clover should enter largely into the pasture grasses, provide rape patches for the late summer and fall pasturage also let your flock pick over the meadow after haying and stubble fields after harvest. All such pasture changes give the sheep a variety. Pasturing the flock on this plan keeps them in perfect health. While sheep are not extravagant eaters, yet they should not be compelled to forage all the year round and do not compel them to subsist on one diet alone. A change is good for them the same as for man. Clover hay is an ideal roughage for them and corn stover is good but roots, beets or turnips go well with the latter as a neutralizer, and an occasional feed of bran will also tone up the system where roughage is scarce. Oats perhaps is the best grain feed. As the lambing season approaches the grain ration should be increased. Have the ewes in good thrifty condition and there will be less loss of lambs, and if roots are fed they have a tendency to increase the flow of milk. If the lambs are weak or the ewe has no milk feed cow's milk till they are able to take care of themselves. Sometimes a ewe will not own her lamb. Be around and keep a grasp on the situation. It is the little details that count for success or failure.

A Member: What about stomach worms?

Mr. Stone: I should not think there would be much trouble with stomach worms on your hillsides. These stomach worms are almost, if not quite, as troublesome as the flocks themselves. Hillsides are what make sheep, and I do not see why Pennsylvania, with all her hills, is not one of the greatest sheep states of the Union.

I want to say that the reason we should

have horses and sheep is, that the rough grass of the pastures can be utilized by the horse, and the sheep will still have enough. They like the new, tender grass, but they do not thrive well on bluegrass. Clover is the grass they want, and yet we hear that clover is one of the most detrimental things we can raise, because it takes a fertile soil. But I think we will have to go on with the sheep, only don't come to me because I can't supply you. Now, gentlemen, proceed: you can cross-examine me all you please, but I can't promise to answer all you ask; my wife wrote the greater part of this, and she is not here. But it's in answering questions that I shine; so ask them.

A Member: Will silage take the place of roots in winter?

Mr. Stone: I can't answer that question, because I have never had any silage in my life. We got into that question a few days ago, at another meeting, and from what they said who feed it I think it will, but I don't think it will do the same as roots. You know when English people get on a certain line, you can't move them off. Therefore when they get on the root question, they stay there. I think if I had a place for silage I would feed it.

Mr. McCann: You don't feed much corn to stock sheep?

Mr. Stone: Not so much; in the winter we feed a little on the cob. Oats is the chief thing. I know an old man who raised sheep, and when he raised corn, he said corn was exactly what his sheep wanted, and when he had oats, oats was exactly what they wanted. My idea is that it is the pasture they need.

Mr. McCann: My father was a successful sheep man, and he fed them two-thirds to one-third corn, and a little bran.

Mr. Stone: Yes, sir; and no doubt in his day you could buy bran for about $8 a ton, but when you pay $30 for it it is not so nice.

Mr. Critchfield: Will horses and cattle eat with a relish that which is left by the sheep?

Mr. Stone: Oh, yes, sir; it has been told by the cattle men that cattle will not graze where the sheep are, but I have not found it so, but unless you have bluegrass land, horses do not, as a rule, graze well with the sheep.

Mr. Bayard: What do you do for stomach worms?

Mr. Stone: Well, sir, I have tried every remedy on earth. There is a man in Ohio that makes a stomach worm medicine; I have been using it for three years, and have tested it thoroughly, and it is the only thing that I have ever found any good. I have bluegrass pasture; it took me twenty years to prepare it, and I think there lies the secret of the worms. They like to make their home in the bluegrass pasture. I have tried this medicine well for three years, and it has been a success, while in the twenty years before, I had a great deal of trouble with stomach worms, and I tried everything, including gasoline.

Mr. Clark: Have you ever tried turpentine?

Mr. Stone: Oh, yes; and the stomach worm will simply fatten on it; you just help him along.

A Member: How about tobacco?

Mr. Stone: I think those stomach worms are just like men; they enjoy it, and it only helps to build them up.

Mr. Henderson: I would like to ask Mr. Stone if he thinks this medicine will help the sheep when they are about dead?

Mr. Stone: If they are dead—oh, no.

Mr. Henderson: I asked you if you thought it would cure a case that is about dead?

Mr. Stone: And I will tell you that if a sheep is about dead you might as well let him die. That sheep is a goner when he once makes up his mind he wants to die.

Mr. Norton: Is he not dead game?

Mr. Stone: Well, he may be dead game, but not in the same sense as you and I. When you once let a sheep go that far, you might just as well let him go altogether, but even if you let him go until he is almost dead, I think it will be helpful to him if you let him lick the salt.

Mr. Henderson: I think a change of pasture is a big thing.

Mr. Stone: I think so too, and that is where the English beat us; but in our hot sections we can't make as many changes in summer as they do; we can't raise them in hurdles. If we could, we would not have to go back to England for our sheep. You know sheep can't stand much of the hot weather.

A Member: You gave us to understand that you feed corn simply to give heat and that you would prefer oats on all occasions?

Mr. Stone: Yes, sir.

A Member: Is that because you are English?

Mr. Stone: Well, no, not altogether because I am English. I study the character of the country, and the conditions. Now, in England, we feed a little oats, but we also feed a great many peas. Now, I don't have the peas; therefore I get down to the next best thing.

A Member: How about cow peas and soy beans?

Mr. Stone: Well, I suppose I ought to know all about it, but I never saw a cow pea in my life, but I think if we can raise cow peas and soy beans where we can't raise anything else, it is all right to do so.

A Member: What is your variety of sheep?

Mr. Stone: Well, sir, I was not going to tell anything about that, for the simple reason that I was not going to advertise myself. My business has gone beyond me. In breeding sheep the sheep that you prefer is the best sheep for you to handle. For you fellows here in Pennsylvania, a heavy sheep is not the best to handle. I breed the Oxforddown, but I think if I was here in Pennsylvania I would breed the little Southdown. I would have a light-footed breed to climb these hills. Then, you have the Merino. He was, I think, a good thing about the time the old gentleman spoke to his son Isaac, when he was caught in the thicket, but I don't think he is a good breed today. On your hill-sides he is a pretty good breed, but if you use a light-footed mutton breed there I think you will do better. You know that a great, big, four hundred pound sheep climbing those hills would not do well.

A Member: Can you tell us something about the English breeds? Do you know anything about the Shropshires?

Mr. Stone: Yes, sir; yes, sir; I brought some across the water; some of the very best that were ever in this country.

A Member: They produce a good deal of good mutton, don't they?

Mr. Stone: Oh, well, I think the Shrop stands about third place.

A Member: I have always understood

that the Southdown makes a fine mutton, but that he does not make good as a breeder.

Mr. Stone: I am not advocating any particular breed, and I don't think there is any one proper breed, but I do think that for a poor boy to start out with the Southdown is not the proper thing. Let him wait until he gets going before he goes in for this breed. I told them in England that we can't tell any difference between Southdown and Shropshire mutton except by its size. Now, I would say that the Shropshire belongs to the fancy variety. You will ask me my reason; you know I have a reason for everything. The reason I give you for the Shropshire being down to the third place today is this: These men in England have bred him for his fancy points, until they have lost size. Now, the American people don't want to eat the head, even if they have to eat it in the head cheese that my brother makes, and when they breed him until the wool goes down to his eyes, there is not much else there. Now, the plain-headed Shrop is all right, but the fancy one is a little behind, and—well, that is the reason I think he is about third class.

Mr. Sharpless: Is it advisable to have the ewes fat at lambing time?

Mr. Stone: I don't want to have them fat on grain. If they get fat on grass I have nothing to say, but if you fatten them on grain I don't believe in that. I have learned in the last few years not to fatten up until we want to sell. You take a man who is a high feeder, and he will get too tight, and it is the same way with the sheep. We used to fatten our hogs in the same way, but now we don't want much fat on them; we want muscle.

Mr. Bayard: When do your lambs begin to come?

Mr. Stone: The first ones came yesterday morning, a pair of them, and I think I will name them for the President and Secretary of this Association.

Mr. Lantz: Why don't you tell the man who makes the stomach worm remedy to advertise in some of the Eastern papers?

Mr. Stone: I think he must be something like me—too modest to advertise himself.

Mr. Bayard: I think he is out in Ohio, and he has advertised with us, but I am not sure whether he does so now, or not.

Mr. Sharpless: If you gentlemen took The Stockman, you would know all about him; he advertises in it.

Mr. McGowan: I would like to ask about the sheep shed that you have described, and what arrangement there is for opening it, so as to get in plenty of light and air.

Mr. Stone: Well, I simply mentioned it to show that a little, cheap affair, would do better than nothing at all. We make a bed with a little straw; that is better than nothing at all. The straw can't muss up, and the lambs will be kept warm.

Mr. McGowan: I think a loft is economical.

Mr. Stone: That is all right for you fellows here in Pennsylvania, with your big barns, and over-hanging lofts, but I was talking of the man who has nothing but the side of a barb wire fence. Here, in your mountains, when a man keeps sheep, he keeps them in the barn, but out in our country, at least, the man who raises sheep does not always have a barn for them, so I mentioned this little plan to show that he need not have an expensive barn. Here in this country, where you have the fine barns with overhead to keep out the wind and cold, you are well fixed to take care of sheep, but when you do not have them, the wind and cold and rain are very hard on the sheep, and we must protect them in some way.

The President: Any more questions?

Mr. Britt: I don't want to butt into this thing, but I would like to take up the question of silage. Now, we are using our corn in this way, and I want to say that we are raising sheep very successfully with it. We began a couple of years ago to simply feed it to the ewes at lambing season, and it answered very well. We put it in the trough, and in a few days we could not get near to put in the silage. We had to put the sheep out before we could put the silage into the trough. It is the most economical way to feed sheep.

Mr. Taggart: I wish you would tell us how you put it up. The sheep do not like it after it begins to sour; that has been my experience.

Mr. Britt: I can tell you how you want to do it. You plant the corn about the usual time, about three pecks of B. & W. corn (Southern corn) and one peck of Northern Yellow corn. Then you drill the two together, and let them grow until the leaves on the lower part of the stalk are beginning to turn yellow. When there is just milk in the grains, we begin to cut it. We find that the yellow corn about that time is pretty ripe, and that is when we want to cut the ensilage corn. The idea is to get the mixture there.

Mr. Taggart: Do you pack the silo?

Mr. Britt: No, sir; we simply throw it into the elevator, and then even it up all around the sides with the fork.

Mr. Taggart: How much do you feed?

Mr. Britt: Well, of course, I have never had enough silage to feed a full ration. To about fifty ewes we feed a two bushel basket.

Mr. Taggart: About a pound to each one?

Mr. Britt: Well, a cubic foot of silage will weigh about forty pounds. That would be about forty pounds.

Mr. Henderson: I might add that we have had a little experience in feeding silage; we used three pounds a day with no bad results. I like to have the corn well matured before I put it in the silo. We had some corn last year that we wanted to put into the silo. When the corn in the field looked ripe we cut it and the stock liked it.

Mr. Taggart: What did you feed it with?

Mr. Henderson: We fed it with bran and oil meal to the lambs; I did not experiment with the ewes.

Mr. Taggart: Did you raise any clover?

Mr. Henderson: We had fed it, but this year we are short of clover, and we are now feeding timothy hay.

Mr. Power: I was wondering what breed of sheep you had, because no good breed would stand so much luxury.

A Member: I have been feeding silage, and have liked it all right. The time you are about ready to cut your corn you cut it for silage also.

Mr. Taggart: You talk about oil cake; what do you pay for it?

A Member: I paid $31 this year.

Mr. Wagner: It is cheaper to feed oil meal at $30 than bran at $20.

Mr. Stone: That is so, but I don't feed either.

Mr. Power: You know it should be fed with silage. Silage is constipating, and you want a little cake, or a little bran. I generally use the cotton-seed meal.

Mr. Norton: Did you ever feed cotton-seed meal to sheep, Mr. Stone?

Mr. Stone: No, sir; I fed it to the hogs, and I had a beautiful lot of dead hogs, so I quit the business and fed salt.

A Member: Mr. Stone, did you ever feed alfalfa to sheep?

Mr. Stone: Yes, sir; I do not grow it, but it is a very nice sheep feed.

A Member: Is your land too poor to grow it?

Mr. Stone: No. sir; but we change our land a good deal, and I grow red clover, and I think it fills the bill. I had some land in alfalfa, and it was all right until we went to break it up. It was like breaking a hazel bush for me. On the timber land in our country it grows very luxuriantly, and on the black prairie sod it grows very beautifully for two or three years, but it does not seem to stand. I have known people to grow forty acres of it, and all at once it disappeared. Where it went to I don't know, but in the spring it went away. In the timber I find it is better every year, but not on the black soil. That is the reason I don't raise any. I grow corn. We live in the corn belt.

Mr. Lantz: The purpose of feeding silage to sheep is not clear to me, and I would like to ask the gentlemen who feed it whether they feed it to take the place of roots for succulence, or whether for clover as nourishment? If they feed it for succulence I think it is dangerous. Another thing, I think roots can be produced at much less expense. I prefer to grow turnips. I raise them and leave them in the field. It does not give you anything to harvest or seed. I would ask whether they use it for roughage, or whether they feed it for succulence. Succulence is an important matter with us. Our Pennsylvania people have not learned this as they should.

Mr. Stone: I think I can answer that. These gentlemen use the silage in the winter, and your turnips would not do in that way.

Mr. Lantz: Oh, yes, I feed them in the winter; I keep them in the cellar, and they keep perfectly dry.

Mr. Stone: You spoke about succulence. I think the ensilage is the cheapest manner of producing this succulence. It produces more tons to the acre than anything else. That is how I look at it. Now, I am a great root fellow, but I find, in our country, that it is the fellow who has to do the hoeing that does the work. With the sun beating down on a man's spine at 110 degrees in the shade it is not a very pleasant job stooping over and hoeing, and we are getting so that we can't get men to hire out on the farms. We can't get anybody to do the work, and I am not going to do it myself; I'm getting too old.

Mr. Lantz: We don't hoe them.

Mr. Stone: But you have to pull them in the fall of the year. For winter feed, I think silo is the cheapest thing.

Mr. Power: I use it to take the place of clover, and for succulence also. I would like to hear from the others, as to what they are using it for.

Dr. Hunt: When I lived out in Illinois I was interested largely in the root crop, and after living for three or four years in New York state, and now in Pennsylvania, I made something of a hobby of this root crop, and I will give you the figures for New York and Illinois. I think I have them in my head. In Illinois we raise 4,800 pounds of corn and oats and barley for each animal weighing 1,000 pounds each year. In New York, we raise 800 pounds, and I fancy it is something like that in Pennsylvania. In addition, we raise in New York one and three-quarters tons of hay to each animal. In other words, we raise in Illinois a large percentage of concentrates, and a comparatively small amount of roughage, while in New York and Pennsylvania it is just the opposite. The problem in Pennsylvania and New York state is not merely to get the protein, and to get the succulence, but it is to get he concentrates to take the place of the 4,800 pounds of corn and oats and barley that we raise in Illinois. Now, take the horse; when he eats a hundred pounds of hay he digests forty-one pounds. Experience shows us that if he digests forty-one pounds, he uses up twenty-four pounds for repair, which leaves him seventeen pounds to put strength and flesh on him. Now, you have only seventeen pounds left to do that with. If you feed him corn, you have some eighty-two or eighty-three pounds of digestible matter. We will say he digests that corn so that he has seventy pounds left, instead of seventeen, to do work and put on flesh. Now, if you want to keep your horses and cows throughout the winter on a small concentrate ration, you can do it, but it will leave them weak, and will not make them fat and healthy for work.

Now, as to feeding roots: They are more digestible than corn. Experiments have been made in Denmark with a hundred and fifty cows, carried on for two or three years. The dried matter in a pound of turnips and rutabagas is equal to the dried matter in a pound of oats and barley. Then, we experimented at Cornell for three years, with every kind of root. We tried rutabagas, mangel-wurzels, sugar beets, carrots, parsnips, cabbage and we found them as digestible as corn, and the dry matter in most of them as nourishing. About one-third of the State of New York is a thousand feet above sea level, where corn does not thrive well, and where rutabagas and mangel-wurzels stand a chance of competing with the corn. Now, what I want to call attention to is this: raise roots to put with silo, or hay, or clover, or anything else. They are valuable as a concentrate feed and are worth about half a cent a pound, whereas the concentrate proper is worth a cent and a half. Silage is valuable because it is a water concentrate. That is why the sheep do so well on it. It does not take any power to digest, and will all go into fat.

Mr. Stone: The Englishman said it was ninety per cent water, but it is a very good water. Now, I want to say a little something before I stop. We have raised mangels for thirty years on the same piece of land, and this year I had the biggest crop I ever had in my life. You will wonder why I don't change; I suppose because I have got in the habit of planting them there. I believe we are getting lazier every year, and I have kept the weeds out of that field until there are no weeds there; that is the reason I plant on the same land. I give it few extra loads of manure every year,

and this year we received a little over thirty tons of mangels per acre, so you see we get a good deal by it.

Mr. Lantz: I am glad that Dr. Hunt is here and has told us why roots are valuable. I only learned it from thirty years of practical experience. I am not a chemist, and I cannot give you the reason, but I know that it is so. I kept sheep for ten years before I fed roots, and nearly every year I had sheep die from indigestion, or some cause that we did not understand. After I began feeding roots that trouble came to an end. The sheep are always in good condition, and experience has certainly proven that it has saved me fifty per cent of the corn ration, and has increased the weight of the fleece. So I made my suggestion merely from practical experience, and never knew just what it was worth to the sheep. I am glad Dr. Hunt has made that clear to me, and I thank him very much.

Mr. Bayard: There will be a smoker here this evening, gentlemen, held in the old dining room. We are going to have a good, social time, with some songs, and a few speeches.

This cup has been donated by Dr. Turnbull. Stand up, Doctor, and let us see what you look like.

Now, gentlemen, just one word: I think it is only fair to Mr. Kelly, the manager of this hotel, that we patronize the hotel as much as possible. If you don't care to pay the price for a regular meal, there is a dining room on the left, where you can order what you want at reasonable prices. I wish as many of you gentlemen as possibly can, would patronize the hotel, to show our appreciation of his courtesy.

The President: We will now stand adjourned until two o'clock. Try to be on hand promptly; we have a good program for this afternoon.

WEDNESDAY. FEBRUARY 5, 2 P. M.

President Norton in the chair.

The President: The first thing will be an address on "Alfalfa in Pennsylvania," by Dr. Thomas F. Hunt, of the Pennsylvania State College. I now have the pleasure of introducing to you Professor Hunt.

ALFALFA IN PENNSYLVANIA

By Thomas F. Hunt

In reply to questions by the speaker, it was determined that in the audience of about two hundred and fifty, five were raising alfalfa successfully, while seventeen had tried it without success. The speaker called attention to the fact that raising alfalfa in Pennsylvania was much like gold mining, that there were many attempts and only a few successes, but that the successes were worth the whole cost.

The speaker called attention to the fact that for many years he had believed that alfalfa could not be raised successfully where red clover grew well. He subsequently found, however, that his failures to raise alfalfa had been due to the fact that the conditions necessary to success were considerably different from those of red clover. The speaker then said:

There are at least seven factors influencing the successful culture of alfalfa. They are: (1) climate, (2) soil, (3) the treatment of soil including fertilizers and lime, (4) inoculation, (5) quantity and quality of seed, (6) time of seeding, (7) after treatment of the crop. The above items are intended to include all the elements necessary for the successful growth of alfalfa. There are some soils and some climates where alfalfa grows so well that not all these factors are essential. The conditions are so suited to alfalfa that all that is necessary is to sow the seed. This, however, is not the situation on most soils in Pennsylvania. If you want to raise alfalfa successfully in this state it is necessary to give careful attention to all the factors as above outlined.

Climate.

Alfalfa is greatly influenced by temperature, much more so than red clover. This can be illustrated by stating that in Arizona two-thirds of all the hay raised is alfalfa, in Colorado one-half, in Wyoming one-fifth, while in Montana only 1-400th of all the hay raised is alfalfa. The alfalfa plant is also affected by moisture. It is a dry weather plant and well adapted to being grown by irrigation. It is especially adapted to that section where the rainfall is less than twenty inches. While this must be admitted it is raised successfully where the rainfall is thirty-five inches as, for example, in the neighborhood of Syracuse, N. Y. One reason for the plant being easily affected by excessive moisture is that it is a deep rooted plant and if the water table is too close to the surface it is killed by getting wet feet. A second disadvantage of a moist climate is that the plant is subject to a fungous disease called the spot disease. This is manifested by the appearance of little black spots on the leaves. A third reason why alfalfa is not adapted to a moist climate is the difficulty of curing it. This is especially true of the first and last crops, assuming that four crops are obtained. Thus, for example, in this climate the first crop is ready to cut about the first of June while, as is well known, the weather at this time is not suited for making hay.

Soil.

The growth of alfalfa, at least in humid sections, is very much influenced by the soil. The following table shows five soil types on which alfalfa has been grown and with four of which the speaker has had intimate experience.

	Coarse sand	Fine sand	Silt	Clay
Dunkirk gravelly loam	13.4	27.6	42.5	16.3
Miami stony loam	4.1	39.7	32.4	22.5
Wabash loam	2.5	28.4	44.7	24.3
Hagerstown clay loam	3.0	8.4	58.8	29.9
Dunkirk clay loam.....	2.4	10.7	56.8	29.9

The Dunkirk gravelly loam is so well adapted to alfalfa that no special effort is necessary to obtain a good crop except the sowing of sufficient seed. The Miami stony loam also raises alfalfa very sucessfully. It is the type of soil on which alfalfa is raised in the vicinity of Syracuse, N. Y., a region famous in the East for fine crops of alfalfa. It will be noted that both these soils contain large amounts of lime and relatively small amounts of silt and clay. The Wabash soil is an alluvial soil, such as is found along river bottoms. Alfalfa is not as easily grown on this soil type as it is on the other two, but excellent crops can be obtained if suitable care is taken. The Dunkirk clay loam is a soil on which it is difficult to raise alfalfa, although fair crops have been obtained. It will be noticed that this soil contains over 80 per cent of silt and clay. One difficulty, no doubt, in raising alfalfa on this soil is that the water table is close to the surface which drowns the plant out in the summer and freezes it out in the winter. On the other hand, Hagerstown clay loam, which has an equal amount of silt and clay raises alfalfa with fair success, one reason being, no doubt, that this type of soil on account of its limestone formation has perfect drainage. Another reason, doubtless, is the fact that it is of limestone formation, the alfalfa plant being a lime loving plant.

A Member: Would it make any difference whether the land was level or sloping?

Dr. Hunt: Not necessarily so. It would depend upon how this influenced the water table. In some regions the water table is quite as close to the surface on sloping land as on level land.

The table showing the different soil types is presented here to call attention to the fact that the Experiment Station may be of service in determining whether a soil is likely to be adapted to alfalfa or not. If a sample of soil were sent to us we could determine whether it was similar in physical properties to Dunkirk gravelly loam or Dunkirk clay loam. While we could not state positively that alfalfa could or could not be grown successfully we could tell you whether it was similar to other soil on which alfalfa has or has not been successfully grown.

Soil Treatment.

To raise alfalfa successfully you should forget all you ever knew about raising clover. Remember that alfalfa is not a crop to enrich poor land. First give your soil such treatment in previous years as to make it a fertile soil. In Europe this is done by growing a root crop. About Syracuse, N. Y., it is found that alfalfa does well after the land has been cultivated in peas. Probably the best preparation in practice in Pennsylvania is to manure sod land for corn, then cultivate the land in corn for a year and seed to alfalfa. Experiments made at the Cornell Experiment Station under the direction of the speaker showed that on Dunkirk clay loam it was necessary to do three things in order to get a successful growth of alfalfa upon that land: (1) fertilize with stable manure at the rate of from ten to twenty tons per acre, (2) lime with from 1000 to 3000 pounds of lime per acre, and (3) inoculate with from 100 to 400 pounds of soil from an old alfalfa field. It was found by actual tests that no two of these three were enough. Success was only obtained when all three were done. While not all soil may require all three, I am in the habit of recommending strongly all three as a matter of safety.

Inoculation.

Land may be inoculated by simply sowing alfalfa seed, although this is a slow process. Land is sometimes inoculated by sowing a pound of alfalfa seed with the clover seed. Thus a few plants become scattered over the field and finally inoculate the soil. While pure cultures are sometimes used the speaker has been in the habit of recommending soil from an old alfalfa field at the rate of one hundred to four hundred pounds to the acre, because actual trials have shown that in at least 90 per cent of the cases this method is effective.

Seed.

A very essential factor in the growing of alfalfa is the sowing of sufficient seed, not less than twenty pounds to the acre should be sown and twenty-five pounds will do no harm. If one is not willing to go to the expense of planting plenty of seed he may just as well not attempt to grow alfalfa. Care should be taken also that the seed should be free from dodder. To determine this a sample of the seed may be sent to the U. S. Department of Agriculture at Washington or to the Agricultural Experiment Station at State College. In order to secure a sample of alfalfa seed for determination of the dodder, place the bag of alfalfa seed in your wagon bottom end up. In driving from the station to your farm the tendency will be for the small dodder seeds to work down to the bottom which will be the top of the sack, so that when you open it you will be likely to find the dodder, if any exists.

Mr. Power: Is it not a little lighter than clover? About the same color?

Dr. Hunt: It has a rough surface and a different shape. It has a brownish silvery look while the alfalfa has a shiny appearance.

A Member: What is dodder?

Dr. Hunt: A parasitic plant that lives on the alfalfa and kills it by growing on it. It is generally of a reddish tint and clings around the plant.

A Member: You sometimes see it in the woods?

Dr. Hunt: Yes; there is a species known by some as "love vine." This species, however, generally occurs further south and does not attack alfalfa plants.

Time of Seeding.

While it is true you can sow alfalfa any time from the middle or even the first of April to the middle of August or first of September, there are times that are better than others. In my judgment it is safer for the beginner to sow in the spring, although I have obtained fair results by sowing in August. The exact date of sowing cannot, of course, be given but the time may be indicated by stating that the proper time for sowing oats is generally too early and the proper time for planting corn is generally too late for the best spring seeding of alfalfa. This is one reason why a good many people fail with alfalfa. They think of it as a clover plant and, like clover, try to sow it early. If it is not sown at the time indicated the next best time is to sow in August.

Mr. Taggart: How about the first week in May?

Dr. Hunt: That depends upon your location. If the first week in May is generally too early for corn planting then it is probably a good time for sowing alfalfa.

Mr. McCann: I think the right time is when you get the weeds all killed.

After Treatment of the Crop.

The first season the alfalfa is planted it should be clipped when it gets six or eight inches high, and the clippings allowed to lie on the ground. This should be continued

every time the alfalfa gets six or eight inches high throughout the first season. The next season, which will be the first crop season, care should be taken to cut at the right time. You will go over the field and find the alfalfa looks small and you will say to yourself: "Well, this is not hay making weather, and I shall just leave it awhile." Then you go about something else and in a week or two you come back and you find a few spindling plants, and you say: "O well, I guess I can't grow alfalfa." What has happened? The plant in this country is subject to spot disease. If you see black spots appearing on the lower leaves you should at once cut the crop even though it may not appear to be worth cutting. It must be done in order to stop the spread of the disease and you must remember that you cannot get a second crop until you have cut the first one. Probably more people have failed raising alfalfa on account of not watching their crop closely enough and cutting it at the right time than for any other reason for which they are responsible. You want to watch your alfalfa as closely as Stone watches his lambs. (Mr. Stone interpolates, "Amen.")

A Member: Will it pay to allow the first crop to rot on the ground?

Dr. Hunt: I would take it off even if it is a small crop.

A Member: Do you use a nurse crop?

Dr. Hunt: I do not like to tell you what I believe about it, because if I do you will go and do it and your crop will be a failure. I can raise alfalfa with a nurse crop, but I do not know whether you can or not. If you sow oats and alfalfa together, the chances are that you will sow at the right time for the oats but not at the right time for the alfalfa. If you will sow only a bushel of oats to the acre and sow at the right time for alfalfa, which is later than the right time for the oats, and if you will cut the oats when they are in the milk you will, other conditions favorable, get a crop of alfalfa. If, however, you sow at the best time for the oats and cut your oats for grain your alfalfa is not likely to amount to anything. I have found that I can talk to a class of students and tell them about this matter and every one of them will go and do just what I tell them not to do.

A Member: If we sent over to Ohio and got a few tons of alfalfa to feed our cattle, and then put the manure on the land, would that inoculate the land?

Dr. Hunt: I do not know, but I believe it would work. I believe, however, it is better to inoculate with soil.

Mr. Powell: Give us a plan for testing the soil.

Dr. Hunt: Send a sample of soil to us and we will make the test for you. Send us two samples, one of the soil and one of the subsoil. Take the soil down to the plow line, say seven inches, and then take a sample of the subsoil below that depth.

Mr. Powell: Take it out with a spade or with an auger?

Dr. Hunt: Of course if one has an inch and a half auger it is desirable to use it, but all that is necessary is to take a spade and secure three or four pounds, both of soil and of the subsoil. Upon receipt of the sample we will send you a set of questions for you to answer.

Mr. Scott has brought in some samples of alfalfa. These samples were cut at the following dates: first cutting, June 24; second cutting, August 22; third cutting, September 25. This season has, of course, been much later than usual. Mr. Scott is in the audience and I would be glad to have him tell us about his experience with alfalfa.

A Member: Before you go any further, please give us your experience in new ground.

Dr. Hunt: I do not see any reason why that should be any disadvantage. In fact, I rather think it would be an advantage.

A Member: Any kind of soil that has been rich that is good for growing corn?

Dr. Hunt: I do not think it depends so much upon what has been in the field if it is the right kind of soil. Of course it is much better if the land has been cultivated for a year.

Mr. Scott will now tell us his experience with alfalfa.

Mr. Scott: Well, I don't know that I can say anything more about alfalfa than Dr. Hunt has said, but he was asked a question about sowing on new land. These samples I have here were sown in 1900 on limestone land that had been cleared and cropped one rotation with corn, oats, wheat, and a second crop of corn, and then it was sowed in alfalfa. I was fortunate in getting a very good stand; it has been mowed every year since that three times each year, and one year four times. That is the first cutting of June 24th; but it was ready to cut on June 1st. But at that time it rained almost every day here in the western part of the state, and there were no weather conditions to make hay, so we had to let it go over.

Mr. Critchfield: What county are you in, Mr. Scott?

Mr. Scott: Washington county, about twenty-eight miles west of here.

Now, in curing, the way I cure it is this: I let it lie about a day, then put it in shocks, and let it stand two or three days, and then change the shocks, putting the bottom to the top, and let it stand three or four days, according to the weather, and then I put it in the mow. I sowed it with barley; cut the barley off, and clipped it twice. Then in 1903, I tried it again, as Dr. Hunt said, sowing with oats, and the result was a failure. Then in 1906 I sowed a piece of about three acres in beardless barley, and I had a very nice stand. In 1905 it was too high to let it stand until next year. Probably some of you know that there are some varieties of alfalfa that seem as though would not grow up and make much stalk, and I came to the conclusion that that was what I had in 1906. The plants would come up just so high, and not get any higher. I plowed it in the spring, and limed it, and in plowing it, I found lots of alfalfa roots to the acre. But it did not seem as though alfalfa would grow there. But I sowed it in barley, and got alfalfa eight and ten inches tall. It has stood the winter very well so far but next year will decide whether it will stand.

Mr. Clark: How much hay did you produce per acre?

Mr. Scott: I had about six tons to the acre—a light crop I thought it.

I would like to ask Dr. Hunt what he knows about bluegrass getting in and choking the alfalfa?

Dr. Hunt: That does happen in land that is adapted to bluegrass.

Mr. Scott: What would be the best thing to do in a case like that?

Dr. Hunt: I would re-plow it and re-lime it and re-manure it, and sow it again. Bluegrass and other grasses are likely to

give trouble in many parts of the East, and that is why I emphasize the importance of putting on enough seed.

Mr. Stone: Now, you know that Joe Wing is a very truthful man. I heard him once tell about the penetrating effects of alfalfa. He said that in digging down into a tunnel out in the alfalfa country they found alfalfa roots 350 feet down in the slate rock. Then Joe got interested in the irrigating business out in Colorado. You remember when it came before Congress? Well, Joe had it on his mind, it seems, to such an extent that he dreamed about it at night, and one night he dreamed that he had died and gone to Hades—I suppose that is what you call it here—and the first thing he saw there was an old friend, and he said to him, "What is this, Dan? this can't be hell!" "No," says Dan, "It don't look like it, and there is some alfalfa growing over there." Finally along comes the Old Gentlemen, and Joe says to him, "Mr. Devil, is this the hot place?" and he says "Yes." "Then how is it that alfalfa grows here?" "Well," he says, "you irrigating fellows turned the water on me."

A Member: You talk about putting on ground that has been inoculated; would not that be a difficult matter?

Dr. Hunt: Oh, no; this matter of putting on soil is not a difficult matter, and it will work; it has been tried.

A Member: I think the greatest handicap in this country is the weeds. You cannot raise alfalfa where the weeds grow. Alfalfa should be grown in an arid soil, where weeds don't grow.

Dr. Hunt: When you have that condition, it indicates one of two things: either you have not the kind of soil that will raise alfalfa, or it has been neglected. Take the Dunkirk gravelly loam; we do not find any weeds there except such as will grow with alfalfa, as dandelion, for instance. Of course, where alfalfa does not grow, some thing else will grow. For instance, we take one piece of land and lime it, manure it, and inoculate it. The other piece we do not inoculate. What happens? In the one we get very good alfalfa, and very little weeds, and in the other we get a good crop of weeds, and very little alfalfa.

A Member: Do they have to lime and manure it in the arid country?

Dr. Hunt: No, sir; I am talking to you about the eastern humid section of the United States.

A Member: How long before you sow the seed do you put on the lime?

Dr. Hunt: It is desirable to apply about a week in advance of seeding. Harrow at once after applying and harrow again just before sowing in order to incorporate the lime thoroughly with the soil.

A Member: Will manuring and liming and inoculating prevent the weeds from coming?

Dr. Hunt: With certain soils at least the doing of the things mentioned will so stimulate the growth of alfalfa that the weeds will be kept in check.

Mr. Palmer: Caustic lime?

Dr. Hunt: I prefer caustic lime myself, a thousand to two thousand pounds to the acre; harrow it in. Let it lie there a week or ten days. Then when you get ready to sow the seed, harrow it again: then a day or two before you want to sow the seed, put on the soil from an alfalfa field; take care that this is not exposed to the sun, otherwise the organism may be killed.

Mr. Critchfield: Put it in with a drill?

Dr. Hunt: If you choose you may use the fertilizer attachment to a grain drill.

A Member: Where can you get clean seed?

Dr. Hunt: I can't tell you; I don't suppose that anybody who buys seed can tell whether they get clean seed or not. The best way to do is to have samples examined as previously explained. The Department at Washington has a staff that does nothing but analyze impurities in seeds and their germinating power.

Mr. Stone: It can be done by taking a box and covering it with a piece of netting, how many meshes I can't tell you; that will clean it.

Mr. Norton: Twenty to the inch.

Dr. Hunt: If you cannot possibly buy clean seed, you can clean the dodder out of it in this way, but the only way to make sure regarding the dodder is to have it tested.

A Member: Is there more than one kind of alfalfa seed?

Dr. Hunt: There is a variety known as Turkestan, but for Pennsylvania conditions it is probably not better than ordinary kinds. I prefer American grown seed to that from Europe or Chile. I would advise getting seed grown in Utah.

A Member: Get it from some western state where they can't grow weeds with it.

Mr. Stone: I think, Professor, that the trouble is that the land is not strong enough to grow alfalfa and a lot more weeds.

Mr. Snyder: Let me tell you my experience with alfalfa. I rented a farm, I think it was in 1892. There had been Polish people on it before, and they raised a great many potatoes. This man read a great deal, and he had been reading about alfalfa, and he sowed some alfalfa. I did not know anything about it, and the first year I didn't take the right care of it. We only mowed it twice. The second year I mowed it three times. We should have mowed it earlier, but the rest of the field was in wheat. We had it for six years right there, and the lower part of the field was in corn, and then I went to plow it up, and the roots were just like alder or hazel roots. I had one root that was three feet long. And then I put corn right there where the alfalfa had been. Right down where the alfalfa had been there was a flat rock, and I think the only reason that the alfalfa stopped there was because of that rock; it could not get through that rock. Well, since it was on the farm, I thought I would try it. I had a piece of new land, about four acres, and I sowed it in wheat, but I had no wheat and no grass; so when I told the neighbors my experience with alfalfa, they said if they were me they would try it there. So I planted it next year. I plowed it and I harrowed it, and about the 20th of August I planted alfalfa. It looked as if I were going to have a splendid crop of alfalfa. Then we had a terribly hard freeze, and the alfalfa was not good. Then I planted it in timothy, and have had that in ever since, but every once in a while we find alfalfa roots there yet.

A Member: The question was asked about seed; do you believe there is any difference in seed, whether you get it from the West or from the South or from the North?

Dr. Hunt: What do you mean by Southern seed?

A Member: The seed grown in warm climates.

Dr. Hunt: There is some seed grown in Texas, Utah, and Western Nebraska; then you can get it from Europe or from South America. I advise people to use North American seed, particularly the seed grown farthest North.

A Member: They have an alfalfa out in Minnesota that is known as the Grim Alfalfa; they sell it at fifty cents a pound. I don't like the idea of paying $30 a bushel for it. What do you know about it?

Dr. Hunt: If I were you I would not buy it. I don't think it is any better for Pennsylvania than that grown in Utah.

The President: The next subject on the program is an address by Dr. Carl W. Gay. Dr. Gay is not here, nor is Mr. Dietrich, the next speaker so we will have the pleasure of listening to Prof. Gilmore, who is on the program for tomorrow afternoon. But before we proceed with the program, we will be glad to have all you people come down here and get your badges, and pay your dollars; we need the dollars, and shall be glad to have you as members.

I will also appoint the following committees:

Auditing Committee: Mr. M. P. Shoemaker and Dr. Thomas Turnbull.

Nominating Committee: Mr. W. G. Powell, Mr. M. N. Clark and Mr. Henry Palmer.

Committee on Resolutions: Prof. H. E. Van Norman, J. B. Henderson, and Dr. Leonard Pearson.

I now have the pleasure of introducing Prof. Gilmore.

CORN PRODUCTION

By Professor John W. Gilmore

Mr. President, Ladies and Gentlemen: This shall be simply a corn talk, not by any means an address, because I think we are interested chiefly in the practical phase of growing corn, and I want to go over some of the points that have a bearing on the production of corn, as well as on the seed quality of corn. I presume that I am quite right when I say that the question of seed corn for the farmers of Pennsylvania will be one of the most important they have to solve during the coming year. As I understand it, from reports that come in from all over the country, the corn that was intended for seed last year is immature and mouldy, and hence, the question of seed corn is a very important one, at least so far as its supply is concerned. Perhaps we can't help that now, but we must take into consideration some of the points that will help us to avoid it in the future. We will therefore take up the question of the corn for seed.

There are several important qualities for corn that is to be used for seed, and one of the most important, if not the most important, is maturity. If seed corn is not sufficiently mature when taken from the plant —not necessarily dry, but mature—it will not be of any service for seed for the coming year. This applies with emphasis to Pennsylvania corn. One of the greatest difficulties we have in Pennsylvania is to get varieties of corn that will mature under our climatic conditions. Many people have to depend on immature corn, because we are apt to get varieties that are too long maturing in our climate. Now, the conditions being such that we will probably have to buy seed corn this coming year, it is important that we should know something about these conditions, especially in regard to maturity. I will say more about this a little later, and then you can take up an ear, and note its quality for seed conditions.

I have here an ear of seed corn that I can open this way with my fingers, indicating that that corn is not dry enough or has not reached a state of sufficient maturity for seed corn. When you take an ear of corn like this, it shows very well that it has not been kept in a warm, dry place. I can't tell whether its vitality has been entirely destroyed, but it is quite certain that it will not be a good seed ear. When it is loose on the cob in this way, it either indicates absolute immaturity or that after its ripening period it has not been kept in a warm place, under conditions that insure its quality as seed corn.

One of the indications of immaturity is when the ear has a chaffy appearance, and when we find the grain set very short; that also shows it has not reached full maturity. Another indication of immaturity is when you look at the kernels, and you find them more or less wrinkled, and more or less dull yellow, indicating that the kernel, which has a high percentage of oil, has begun to deteriorate. So, altogether, we have a number of indications that will give us an idea of the maturity of the ear, and that is one of the most important features, because if immature, it will not give us a good crop.

The next question is vitality. We may have an ear of corn that is sufficiently matured and properly kept through the winter, yet its vitality may be very materially injured by freezing and improper conditions during winter keeping. I would advise you next summer to go through your neighbor's corn field, and estimate the standard of his corn. I don't advise you to go through your own, because you are going to have a good stand. Last year I went through a corn field that was planted by a very good farmer, a man who has good culture methods. and I counted three rows, each three hundred feet long, making nine hundred feet of row. This corn had been planted with a drill, and planted about a foot apart; at least that is how he intended to plant it. As a matter of fact, they were on an average about eighteen inches apart, making a loss of about thirty per cent in the stand of that corn. Another thing I found was that fully ten per cent were barren stalks, making altogether a loss of forty per cent; in other words, forty per cent of that field was not producing anything. Now, you go to Mr. Kelly who runs this hotel, and ask him what his idea of management is, and I presume he will tell you that he tries to have every room in this building filled by people who pay their bills. The same principle applies to corn fields. You want your fields fully occupied by corn stalks that bear corn. Yet this field that I have just spoken of is not very far from the average. Any one who has counted in this way will tell you that from forty to fifty acres out of every hundred is wasted—has no corn in it. And it is on this question that the vitality of the seed has its practical bearing. While it is true that we can plant corn, every grain of which will produce, a great deal of the corn that is planted is very low in vitality, and it cuts down not only the stand, but the yield of the corn.

While I am on this subject, I will describe briefly, some method by which the vitality of the corn can be determined. You cannot tell by looking at an ear of corn what it will do in the same manner as you can determine its maturity. The best thing we can do is to test it and find whether we have a sufficiently productive seed before we plant it. That may be done in this way. You take a box eighteen inches square—you may make it larger or smaller, but I think that is about the size I would use—and about three inches deep; fill this box one-half to three-quarters full of clean saw dust; not dirty saw dust; wet thoroughly, and after it has been leveled spread over it a piece of cloth that has also been wet, such as this, which has been marked up into squares of about one and one-half inches. Now, if you buy your seed corn—I don't advise this, but if you have not enough I suppose you will have to buy it—pick from the ears a sample of grains from each ear, numbering your squares to correspond with the ears from which you have taken the grains, which are also numbered, and put in a suitable place to germinate. Take from five to ten grains out of an ear, turning it over, because it often happens that one side of the ear has more vitality than the other, according to the way the ear has lain. The upper side is often more dried out than the lower. Thus is becomes necessary to take it from all sides. Take grains from ear No. 1, and put them in square No. 1, and so on; then moisten it thoroughly, and cover it with some burlap bagging, and set it away where it will be sufficiently warm to germinate the corn. If you have a smokehouse, or something of that kind, which requires heat to be kept up, it will do very nicely; then let it stand for six days, and see what the result is. If it does not germinate more than four grains out of five, or eight out of ten, it will not be suitable for planting. The chances are that it has not sufficient vitality to produce a good crop.

I have been looking over the average production of corn in Pennsylvania for the last forty years, and find that it runs somewhere between thirty-two and forty bushels per acre. Now, it is possible to increase that yield by adding any assistance in our power that will enable it to do its part. We find that the corn is usually planted three stalks in a hill, three feet apart, and if we take care to see that the grains we plant are sufficiently full of vitality to bear, we can very materially increase our production by simply paying attention to the vitality of our seed corn. According to the standard of Pennsylvania production, this question of vitality it not to be neglected.

Another important point is productivity. There is just as much difference between the productivity of the different corn plants as there is between cows. Every grain of corn is capable of a degree of productivity, just the same as an animal is. That is a quality for which you have been breeding live stock; particularly in the last fifty years great stress has been laid upon it, but no attention was paid to corn until the last few years. There are certain things in regard to this on which I will not enter now; suffice it to say that oats, clover, wheat, timothy, corn and other crops are just as capable of improvement by the same general methods as horses or cattle or sheep are, so that we have to pay attention to the productivity of corn. You are all aware that there are certain grade cows which will produce as much milk and butter-fat during the course of the year as a good many highly bred registered cows; you are also aware of the fact that the progeny of these grade cows are not so likely to produce as much as will the progeny of the registered cattle, wherefore the grade cows are not as valuable as the registered cattle. It may not be possible to produce the pedigree of an ear of corn or of a grain of wheat, but we can introduce principles of breeding into our crops in that respect just the same as we can into our animals. It is with this in view that we want to look to the productivity of our ears of corn. We don't want stalks that are sterile.

Now, I want to say something about the introduction of seed corn from some other locality. We hear a good many farmers say that seed corn runs out, oats run out, and potatoes run out, and it is necessary to go into some other locality to get the seed. So it will be, if you allow them to run out. If you buy an Oxfforddown from our friend Mr. Stone, and leave him out in the wind and the weather, and pay no attention to him, at the end of the year you will not have the same quality of sheep that he was. The same thing applies to corn. If you get good corn, and put it into poor soil, and give it poor cultivation, it is probable, of course, that it will run out. The same care that you men exercise in breeding cattle, and taking care of the individual, and

Then I come to the last, percentage of keeping up the standard, must be exercised in keeping your farm crops up to the standard required. We must have ideals in our minds, and keep them constantly before us. When a man is diligent in caring for his crops, putting them in suitable soil—Prof. Hunt has just shown us how it is possible to grow alfalfa under suitable soil conditions, and the same thing applies to other crops. If we put our crops in the best soil possible, give them the best culture possible, and have an ideal of what we want and keep it before us, there is no reason to believe our crops will run out. So when we import seeds from other localities, it is necessary to get that which is best suited for our purpose and environment. When we send to Iowa, Ohio or Maryland for corn, when we get Reid's Yellow Dent and Leaming or Boone County White, it is not so much these varieties that we want, as the environment in which they grew. Consequently the best thing for us is to provide our own seeds by doing everything in our power to produce them.

Now, I want to say something about improving our corn, and what I shall say will apply particularly to these Pennsylvania varieties. I presume that corn has been quite as instrumental in improving our animals as anything else. But most people fail in their estimate of corn and other crops because they do not take into consideration all the elements of excellence and quality that may be necessary to be considered. For instance, you go into the corn crib or potato cellar, and find an excellent specimen; you say it is excellent because it is healthy, large, a fine looking specimen in every way. Now, if you select that specimen on one of these factors, the

chances are that by planting that specimen you may not succeed in producing what you desire. The fact is, you should take into consideration other factors.

The score card, while imperfect in many respects, yet serves to emphasize some of the features of a good ear of corn. When these various features are given their relative values and then considered along with yield and environment a good basis for improvement is established.

Uniformity of exhibit and trueness to type	10
Market and seed condition	10
Shape of ears	5
Color—Kernels	5
Cob	5
Tips	5
Butts	5
Length	5
Circumference	5
Kernels—Shape	10
Uniformity	10
Furrows between kernels	5
Space at cob	5
Percentage of grain	15
	100

For uniformity and trueness to type, we give 10 points; while this does not necessarily apply to the excellence of seed corn, we all like to look at beautiful things, and I claim there is just as much beauty of its kind, in an ear of corn of good length and straight rows, as there is in anything else; therefore it is quite as proper to show a beautiful ear of corn as a beautiful picture. Therefore we give ten points for uniformity and trueness to type. Next comes the market and seed conditions, which I have just referred to. Of course it will be impossible to judge it strictly—I propose to use this score card in judging the exhibits—on these points, because most of the corn has been recently taken from the crib, and in looking it over I find very few ears that are dry or have the market features in prime condition. We give that 10 points. So far as the shape of the ears is concerned, we only give it 5 points. Ears differ so much in shape, but, in a word, we like an ear that is as nearly cylindrical as possible. Still, it can be said from actual experiment in the field, that there is no relation between true cylindricity and the highest yield. It has been determined at the Ohio Experiment Station, and at the Illinois University that the largest yield comes from slightly tapering ears. The ear may be slightly tapering, medium tapering, or cylindrical, but the more nearly cylindrical it is the better. Then comes color, 5 points. Frequently the color shows whether the breeding has been poor, or otherwise. A yellow corn should be strictly yellow, and the color of the kernels should be uniform. Then comes the cob, 5 points. Then the tip, 5 points. Not much has been said about the excellence of the tip, and yet a poor tip detracts from an otherwise good ear. I would like to call your attention to these three ears; one of them is very good, one medium, and one very poor. Likewise I hold in my hand two ears that illustrate two qualities of tip measurements. The one is well filled and rounded out, while the one on the left is very poorly filled out at the tip. Now, in judging, this will, of course, be scored, but I want to call your attention to the fact that excellence of yield and vigor does not necessarily mean excellence of tip. Now, you will readily notice that the long ear is the more desirable of the two. It has more corn on it. I believe it is easier to increase the yield of corn of this shape than it is to increase the length of this particular cob. It it possible to over-emphasize the appearance of the tip, and leave out the other consideration; nevertheless an excellent tip looks well.

Then we come to the butt of the ear. Here we have also a quality that is as important as the tip. Here, for instance, are two ears, and I can show you again on them, the small, medium and large kernels. If you will look at this ear, you will see it well filled out at the butt, with the rows, regular, and straight up to the end. We want to take this fact into consideration, because it indicates strength and vigor of growth, and it also bears some grains that look as though they might be valuable for feed.

Then we come to length; we give this 5 points, because it is a factor that is quite important. Here we can turn again to the ear; when the length is in proper proportion it makes a beautiful ear. Take the Dent Corn; here we have a variety that has a circumference of two inches from the butt, and is 75 per cent of the length, and it is a good looking ear. I would pay more attention to the length than I would to the excellence of the tip, but I think with better methods of corn culture, we can improme them both.

Mr. T. E. Orr, who was a judge of poultry was talking about the hen. He had her standing on the table in front of him, and was talking about her good qualities, when some one, who evidently was not acquainted with her, or with the good points of a hen, wanted to know what were the factors of good appearance in a hen; he thought for a moment, and then said, "if she fills your eye, is perfect in her shape, in her proportions, then there is no doubt of her excellent qualities." So it is with the ear. The ear which shows a proper proportion between circumference and length and is well filled out, leaves little doubt of its good qualities. On the other hand, the ear which, while it may have a reasonable circumference, shows lack of form in some way, and lack of strength and vigor in growth. Take this ear, for instance; it is a little too long for its circumference, and it has not the most desirable form.

Next comes the shape of the kernels. Now, the shape inidcates two things, either weakness in growth, or vigor. In the first place, we want them fitted as full as possible; this means that they are not too long, but are more or less square, as in this ear. Take this ear of Dent corn; as we look at it from all sides we see it slightly tapering toward the tip, with rows well filled out and close together. It is not desirable to have the rows dovetailed together, but we would like them to run well together tapering. Now, if it tapers when you look at it in this way, it indicates poor seed qualities. Sometimes you can tell something about the seed quality of the corn by the shape of the kernel. You want to avoid the shoepeg shape of the kernel. They are slow in their development, and have small kernels. Likewise, you want to avoid furrows between the kernels. That happens sometimes because of the shape of the kernels, and sometimes because of the size of the cob. Of course, there is the famous "Hickory King" corn of the South, which is characteristic in that respect, but in all other respects this wide row or furrow between the kernels should

be avoided. Here is an ear that is very irregular, and here is one that shows a very small kernel. Now, this is important, because most corn is planted with a planter, and irregularity in size and shape will almost invariably result in irregularity in planting. The idea is to have it uniformly planted. If you want three stalks to a hill, you want three, and not five in one hill and three in another, and so you take an ear of this kind, while it may be vital and productive, it is a poor seed ear, because it would plant irregularly.

Then I come to the last percentage of grain, 15 per cent. Now, some of the score cards that are used in Iowa and Nebraska do not use this; they speak of the size of the cob, and so on. But for Pennsylvania it is better to use this. In this part of Pennsylvania we do not, as a rule, want a large cob, because a large cob indicates a long growing period, and also because a smaller cob is more easily dried out. With the large cob you have a variety that requires a long growing period, and, in addition, it is difficult to dry out. When you have a smaller cob, it indicates a shorter growing period, and a larger percentage of corn, and a shorter time for drying out. This question of maturity and drying is one of the greatest importance. In fact, I think the poor condition of our seed corn this year is due to slow growth, and drying. From Reid's Yellow Dent and Leaming, we should expect from 84 to 86 per cent of grain. So when we take into consideration all the points here noted, and the values given here in regard to the excellence of corn, and follow up these points in our selection of seed corn, there is no danger of our crop running out.

Now, I know that the time is getting short, but I would like to say just a word or two in regard to the selection of corn. A good many people have selected their corn for a number of years from the crib after the corn was husked. Now, there are two reasons that render this method not the best. One of them is that the selection has not been completed before the freezing weather sets in. Corn that is intended for seed corn, should not meet freezing weather until it is quite thoroughly dried out—not necessarily dried by artificial heat, but it should be thoroughly dry, and then freezing does not hurt it so much, but the danger is that if it is not selected before freezing weather, and thoroughly dried, the vitality will be destroyed. Another reason why selection from the crib is not the best is: you will look into the crib and see some good-looking ears. You do not know anything about that ear. You do not know whether it grew on a stalk in a hill by itself, or whether it grew with other stalks. What you want to do is to get for seed corn, the corn that will do the best in the environment in which you expect to plant it, and you know by experiment that the standing quality of that corn is hereditary. It has been definitely proven that a large percentage of stalks that have fallen down produce the same kind, while stalks that stand up before the wind produce their kind. Now, in selecting out of the crib, you do not know anything of the conditions under which this corn grew. If you select the corn for seed before the harvest, you will be able to see under what conditions it grew, and select it from a good stalk. You should see that the stalks are good, that the ears have a good appearance, are well filled out, have good tips, and in fact, have all the points mentioned on the score card. These ears selected from the field do not always have the good appearance of the ears selected from the crib on their appearance alone, and yet experiments for two consecutive years showed an increase of seven bushels per acre over those selected from the crib. And the same thing applies to the potato. If you want to keep up the quality of your potato crop you will select your seed potatoes from the hill rather than from the cellar. In selecting from the cellar, you don't know in what kind of a hill that potato grew, whether it was one potato on a vine, or whether it was one of many, or even whether it was the one big potato among a lot of little ones on the same vine. Consequently, selection from the field is best to follow, for educational value as well as for the greater possibility of excellence of material and yield, and with that I shall close.

The President: Are there any questions you would like to ask Prof. Gilmore?

A Member: How do you select the seed corn, and when?

Prof Gilmore: When you go into the field while the corn is still standing, just about the time you are ready to cut it, but before you cut it. Then mark these ears so that when the season approaches you can take them in out of the weather, and dry them perfectly.

Mr. Snyder: I always select my seed corn when I husk it, and haul it in. I always have a box on the wagon, and select it as we go along, and put it away.

Prof. Gilmore: That is all right so far as is goes, but if you select it at the time of husking, you don't know where that corn grew, or how it grew.

Mr. Snyder: Well, I tried the other way, and I thought it took too long.

Prof. Gilmore: It takes fifteen ears of good corn to plant an acre, and if you can improve your yield by 40 per cent, I think it will pay you to take the time to select them.

A Member: I was thinking of sending to West Virginia for my seed corn. I wish to get the kind that grows closest to us.

Prof. Gilmore: That is very practical. In getting seed corn, I would advise getting it from as near to your own environment as possible. Get it as far North as possible. If you send to southern Ohio you would get a variety that is of longer growing period.

Mr. Wagner: The chances are that it would mature too late in Pennsylvania.

Mr. McCann: I want to raise a point with regard to the distance. You advocate having the stalks three feet apart?

Prof. Gilmore: If you have your stalks a foot apart and your rows three feet apart, you will have the same number of stalks to the acre as you will have to check-row it for three stalks to a hill.

Mr. McCann: The best crop of corn I ever raised was planted sixteen inches apart and nearly four feet the other way.

Prof. Gilmore: You are from Chester county?

Mr. McCann: No, sir; I am from Washington county.

Prof. Gilmore: Down in the South they plant farther apart than that when they plant for ensilage, but we do not plant so far apart.

A Member: I want to be understood; I am glad that I am as far East as I am, but I would like to ask this question: Do you know what percentage of yield per acre

is gotten from this point East as compared with the middle West? Do we raise as much as the middle West?

Prof. Gilmore: Our statistics are for corn in the ear, while in the West they base their estimates on shelled corn, but I think that, if anything, Indiana and Illinois are a little ahead of us.

The President: We have a full program tomorrow, and trust you will be on hand in time. We now stand adjourned until 9.30 tomorrow morning.

THURSDAY, FEBRUARY 6, 1908, 9.30 A. M.

President Norton in the chair.

The President: The meeting will please come to order. We will take up the first subject on the program, an address by Dr. H. P. Armsby, Director of the Institute of Animal Nutrition, Pennsylvania Experiment Station, on "Balanced Rations for Cattle." I have the pleasure of introducing Dr. Armsby.

BALANCED RATIONS FOR CATTLE

By Dr. H. P. Armsby

Mr. President, and gentlemen of the Association: It is a very great pleasure to me to be here and meet this large gathering of the Stock Breeders of Pennsylvania, and to learn of the very interesting meetings which I understand you had yesterday. When I left home yesterday, the thermometer was down somewhere about zero, but as soon as we came across the mountain, and approached Pittsburg, it began to grow warmer, and I understand now that it was the warmth engendered by your Society yesterday. My subject is an old one, but I hope to suggest at least a little modification in one way of looking at it. I shall consider it especially in its relation to the feeding of beef cattle.

We all know in a general way what is meant by a balanced ration, but we shall, perhaps, get a little more definite understanding of it if we consider how the animal machine which we term the body works. We are aware that the working machinery of the body is composed of what the chemist calls "protein." Now if I were wise enough I could stand here all the morning and tell you what the chemist knows about protein, but for our present purpose it is sufficient to say that protein is like the white of an egg or washed lean meat. It contains the element of nitrogen, and it makes up the working machinery or the structural part of the body. Then, in addition to that, we have more or less fat in the body, which is not essential to the working of the body, but constitutes a reserve of force or energy. The food that has been given to the animal in excess of its immediate needs has been turned into fat. Of course there are other things in the animal body, but these two are the essential ones, the protein making up the working machinery, and the fat, which may be called reserve fuel.

Now, there is a pretty close analogy between the body of a man or an animal and a gasoline or steam engine. They are not exactly alike, of course, but in one respect they are very similar. They are both machines for the conversion of chemical energy into work. In the steam engine, for example, we burn coal under the boiler, and by various devices we convert the resulting heat into work, which we apply for our own purposes. In case of the gas, alcohol or gasoline engine, the transformation is more direct. The fuel is burned in the cylinder of the engine and its energy converted in this way into the motion of the piston and so into work. In much the same way the animal burns fuel and produces work. The fuel is its food—corn, for instance. I remember that several years ago the farmers in the Middle West were burning corn for fuel, because the price was so low that they could not afford to haul it to the station. They might also have burned the corn under the boiler of an engine and so used it as a source of energy for the performance of work. Now, when we feed corn to the animal, that corn is burned, just as truly as fuel is burned under a boiler, and we can utilize its energy in the shape of work done by the animal. Moreover, if we do not utilize it all in this way the animal will store the surplus in the shape of fat and meat against some future time of need. Then, when we slaughter the animal and eat the meat, we are using this stored up fuel to drive our own bodily machinery. We, ourselves, cannot eat hay, or bran, or cottonseed meal, but we have converted them into beef or pork, or mutton or milk, which we use as a source of energy to our own organism.

Now, if we are running a gasoline engine on our farms to do our work, we must have iron and brass and babbitt metal and similar materials to keep that engine in repair. The same thing, exactly, is true of the body of the animal. It wears out constantly, and must have repair material continually. Now, as I have pointed out, the chief constituent of the body is protein, and to repair it we must have protein. We can no more keep it in repair by giving it starch or sugar or fat than we can keep a gasoline engine in repair by giving it more gasoline. These things furnish fuel, but they cannot be used to make repairs. It seems that almost anything the animal can digest can be converted into fuel, but to build up and repair, we must have protein material.

As you know, I have been interested during the last few years, in studying some matters relating to the supply of energy to the body, but I propose to speak to you this morning of the necessary supply of protein material to the body.

We are accustomed to speak of a balanced ration as one which contains protein and fuel material in due proportions, and we make calculations showing what the nutritive ratio should be. I think it would be better if we looked at the matter in a different way. A ratio is always a difficult and misleading thing to deal with, and I think that instead of figuring upon the relation of protein to carbo-hydrates, it would be better to figure on the absolute amount of protein required, that is the actual number of pounds. In running a gasoline engine, a certain amount of repair material is required. It does not make so much difference whether much or little gasoline is used, you have to have about so much repair material anyway. Now, this is even more true of the animal. Under any

given condition the working machinery of the body wears out at about the same rate whether the food supplies a moderate amount or a large amount of fuel material. There is this difference between the animal and the engine, however, that the former can use surplus repair material for fuel. The repairs in the animal body can only be made with protein, but protein can also be used as a source of energy. It, therefore, does not make any particular difference what proportion of protein you have in relation to the fuel material, provided you have enough pounds of protein for repairs. Take the case of a thousand-pound steer standing quiet in the barn; he will need about half a pound of protein a day to keep his bodily machinery in repair. Now, provided you give him a ration that contains half a pound of digestible protein, it does not matter so much whether you give him only that half-pound or whether he gets a pound, or two pounds. He must have the half-pound of protein. If you give him a pound, he will have half a pound which he does not need for repair and which he may use as fuel in place of an equivalent amount of carbo-hydrates or fat. The one ration will do as well as the other, so far as protein is concerned. The second one will give him a little bit more fuel material. It is not necessary that there should be some exact proportion of protein, say one part to five and a half or six parts of carbo-hydrates, that is, it is not necessary in the sense that the animal cannot use the ration unless it is just in that ratio. What is necessary is that an animal shall have enough protein to supply repair material and normal growth. If he has that, it does not matter so much what you add for the fuel material. Ordinarily, of course, the latter is chiefly carbo-hydrates and fat, but any protein in excess of that needed for repair and growth also serves as fuel material. The whole matter of the balanced ration, then, resolves itself into this: that the food must contain at least a certain minimum amount of protein, varying with the purpose of the feeding, and must supply enough fuel material to run the animal and allow a proper excess for the production of fat if that is desired. In practice, however, protein usually costs more than carbo-hydrates and fat and therefore we try to use as little protein as possible. but it is not the ratio of protein to the other materials which we have to consider as much as its absolute amount.

It has been shown that in a ration low in protein, and with a large proportion of carbo-hydrates there will be a little loss of digestibility, and it has been advised on that account that it is well not to have more than eight or ten parts of carbo-hydrates to one of protein; that is, a nutritive ratio, 1:8 or 1:10. In general it is not wise to curtail in protein at the expense of digestibility, yet it is easy to imagine circumstances under which it would be more economical to suffer some loss of digestibility than to pay excessive prices for protein. Ordinarily, however, unless we go to extremes in reducing the protein of our rations to the lowest possible limit, there need be little apprehension of loss on account of impaired digestibility.

The point of view having been thus indicated, we come to the question of the specific protein requirements, particularly of beef cattle. This question we may sub-divide into three; first, as to the amount of protein required by young, growing cattle; second, the amount of protein needed for mature cattle; third, the amount required for cattle at the age at which they are usually fattened in this country.

First, young and growing cattle: Growth, of course, is the increase in size of the body; that is to say, the body is increasing its working machinery, therefore it calls for a liberal supply of protein, because the working machinery is made up of protein. Consequently the demands of young, growing cattle for protein are larger than those of maturer animals, and they have the capacity to store a larger amount than the maturer animal. Of course, it is not fair to compare the amount which a one hundred pound calf stores with the amount which a thousand pound steer stores away, but if we take a calf of about a week old, we find that it will store in one day in its body protein amounting to about two and one-third per cent of what it already has in its body. That is, if there were ten pounds in his body the calf will store up every day a little less than a quarter of a pound. At that rate, it would double its stock of protein in forty-two days. It might not exactly double its weight, but it would double the weight of its working machinery. When the calf is three weeks old it is able to add 1¾ per cent to its protein stock in one day, which would be equivalent to doubling its amount in fifty-eight days. At two months, it would require about 150 days, to double the amount of protein in its body, storing up a little over two-thirds of one per cent a day. A steer 2½ years old would store only about 0.07 per cent, requiring, at this rate 740 days to double its stock of protein, while a week old calf would do it in forty-two days. In other words, the capacity for storing protein is highest in the young animal and decreases as the animal grows older, and consequently the protein requirement of the young animal is likewise high.

If you have a young pig, and you feed him largely on starchy food, like cornmeal, the chances are that you will not give him enough protein to supply the material for growth, and it will tend to a production of fat, rather than meat. These are facts that are fairly well known. The protein requirements in cattle, as in other animals, are high in young animals and decrease as they grow older.

At the other extreme stands the mature fattening animal. Such an animal needs sufficient protein to keep his bodily machinery in repair, and probably very little, if any more. As I said before, such an animal needs something like half a pound of protein for repair material—certainly no more. Some experiments have indicated as litt'e as one-third of a pound, but half a pound is probably the safer estimate—corresponding to a nutritive ratio of about one to fifteen. The mature fattening animal is producing fat, and simply keeping his bodily machinery in repair. He needs, therefore, chiefly material to make fat, and very little protein.

Most of our beef producers, however, do not fatten mature animals, but animals approaching maturity, and the tendency has been to fatten these animals for the butcher at an earlier and earlier age. I suppose that the standard would be about two to two and a ha'f years old—practically what we call a two year old. There has been some so-called "baby beef" produced, but

not a very large amount, up to the present time.

Now, animals of that age occupy an intermediate position. They need less protein than a very young animal, and more than a mature one. Unfortunately, we have no accurate data as to the lowest amount of protein required by cattle. It is a question well worth investigation, but it has never been gone into in a scientific manner. It is, however, possible to take the results of some of the trials at our experiment stations and get at approximate figures. For instance, suppose we feed to a lot of two-year-old cattle a ration containing a pound and a half of digestible protein per day, and to a second similar lot a ration supplying two pounds of digestible protein per day. If better results are shown on the two pounds a day, all other conditions being equal, we can safely conclude that a pound and a half of digestible protein was not enough. In this way by comparison we can get approximate figures, by which we can estimate the least amount of protein required. This is an empirical way to determine the matter, but it is the best we have now.

Approximate protein requirements, per 1000 pounds live weight:

Cattle.	
Maintenance	0.5
Meat Production:	
Age 2-3 months	4.0
Age 3-6 months	3.0
Age 6-12 months	2.5
Age 12-18 months	2.0
Age 24-30 months	1.5
Mature	1.0
Sheep.	
Maintenance	?
Meat Production:	
Age 5-6 months	3.5
Age 6-8 months	3.0
Age 8-12 months	2.5
Age 12-15 months	2.0
Age 15-20 months	1.5
Swine.	
Maintenance	?
Meat Production:	
Age 2 months	3.0
Age 4 months	2.75
Age 6 months	2.50
Age 8 months	2.25

Now, on this chart you will find approximate figures showing the amount of protein required for cattle and other meat producing animals. You will understand, please, that these are approximate figures; they don't mean that a two to three months' old calf must have just exactly four pounds of protein per thousand pounds of live weight, but that it should be somewhere near that. Then, as the animal grows older, the amount of protein required diminishes somewhat in proportion to these figures. I emphasize that, because it is unfortunate to get the idea that it must be followed exactly. It is not a scientific deduction, but the expression of the results of practical experiment. It is a general guide, and not something that must be followed to the very letter. But I don't want you, either, to go away with the idea that it is of no particular importance. It is of the very greatest importance that we supply the proper amount of protein, as I will show you in a few minutes.

Now, since it is of such vital importance that the animal shall have a reasonably liberal supply of protein, where shall we get it? The ordinary feeding stuffs of the farm, particularly corn and corn fodder, timothy hay and straw, are deficient in protein. For mature animals they probably contain enough, but for growing animals we find we cannot figure out a ration in this way that will supply enough protein. We must, therefore, get some kind of material richer in protein to go with the material that grows on the farm.

Now, there are two ways in which we can supply this material: one is to go out into the market and buy feeds rich in protein, like oil-meal, or bran, or gluten feed, or cottonseed meal, or brewers grains. This is a method which has been practiced to a considerable extent, and which has been recommended very strongly, especially, perhaps more by those who, like myself, have been in the habit of looking at the matter from a scientific viewpoint, rather than a practical one. The other is, to try to raise it in some way on the farm; that is, to try to get the protein out of our own crops, instead of depending on the market. Now, either is a good way, and its practicability in any particular case depends on the conditions. Under some conditions it may be cheaper to buy your protein than to raise it, and under others, cheaper to raise it than to buy it. Of course, in raising the nitrogenous crops like soy beans or cow peas, it is necessary to take into consideration the effect they will have in improving the soil, but it is after all a question of relative cost, into which I will not enter at this time. Instead, I want to present a few figures from actual experiment to show that it is profitable, in fattening cattle for the market as they are usually fattened in this country, to supply more protein in the ration than is usually given and that this may be done in either of the two ways I have mentioned.

The Illinois Station reports in their Bulletin No. 83 their results in fattening carload lots of steers. Lot 1 was given corn, timothy hay and corn-stalks—an ordinary feed, rather poor in protein. They gained 1.86 pounds a day. Lot 2 was fed corn with clover hay in place of timothy, and that lot gained 2½ pounds a day, on the average. Lot 3 was fed corn, gluten-meal, timothy and stover and gained 2¼ pounds a day, instead of 2½. For every hundred pounds of grain fed. Lot 1, getting corn, timothy and corn-stalks gained ten pounds. Of the other two lots, the second one, with the corn and clover hay, gained thirteen pounds for every hundred pounds of grain, and the third lot, on the gluten feed, gained 13.4 pounds for every hundred pounds of grain. The first lot gained 7.6 pounds, and the other two 9.3 pounds per hundred pounds total feed, they being practically the same. The report says that the gluten ration gave a higher and a quicker finish than either of the other two, and even at the higher prices paid, the gluten was a trifle the better investment. The corn, timothy hay and corn-stalks did not contain enough protein, and when this lack was supplied, either by the use of clover hay or of gluten meal strikingly better results were obtained, and the clover hay and gluten-meal seemed to be about equally efficient.

At the Nebraska Experiment Station one lot of two-year-old steers were fed with snapped corn and prairie hay, and gained 1.2 pounds per day. Another lot was fed on snapped corn and alfalfa, and gained two pounds per day. The first lot gained 12.7 pounds and the second 21.7 pounds for every hundred pounds of grain consumed, or the first lot gained four and one-third pounds for every hundred pounds of total feed they ate, and the second lot 6½ pounds.

In the same series of experiments, they tried adding nitrogenous concentrates like oil-meal or cottonseed meal, and it was found, just as in the Illinois experiments, that there was a marked advantage, although the gains weere not quite so cheap as with the alfalfa.

They tried still another lot, for which I have not the figures here, using one-half alfalfa hay, and one half corn fodder. They got just as large a gain, and a cheaper gain than with the alfalfa alone. The corn fodder was cheaper than alfalfa, and evidently a half ration of alfalfa furnished all the protein that the animals needed.

I want to call attention to some results recently published by the Missouri Station in Bulletin No. 76, and I want to recommend the study of that bulletin to those of you who are interested in the production of beef. It contains an account of some experiments conducted at the Missouri Station. Now, the point I want to call special attention to is one of the results in this matter of using roughage. In the first place, they point out that by using foods like alfalfa, cow peas, or clover, they can get their animals to use more coarse feed, thereby diminishing the cost of the ration. This larger consumption of coarse feeds, however, does not prevent the steers from consuming a full grain ration. Indeed, rather more grain can be fed with a legume hay, than with timothy or corn stalks. Finally, as regards the cost of production, they estimate that one bushel of corn fed with timothy hay will average 4.93 pounds of gain—practically 5 pounds—while one bushel of corn fed with clover and cow peas will produce 6.6 pounds gain, a difference of 1.6 pounds of beef gained for each bushel of corn by using it with the nitrogenous forage crops as against timothy. "Rating this gain at the low price of 5 cents per pound, this means that the feeder is getting 8¼ cents per bushel more for his corn by combining it with some such hay as clover or cow peas than when it is combined with good timothy. If one-fifth of all the corn produced in Missouri were fed to cattle, the increased profits from combining it with clover or cow peas as compared with timothy would amount to $2,500,000.00 each year.

"The profit is not all, however, in the increased gains secured by the use of legume hays like clover and cowpeas, for, in addition to this, the steers get fat quicker, fatten more uniformly, and show at the end of the feeding period a higher finish and carry more bloom and are altogether smoother. By reason of these facts they will sell from 10 cents to 25 cents per hundred more on the market, or will add from $1.25 to $2.50 to the value of each steer so fed over and above the economy in the gains already referred to.

"It may be further stated that the hog following the steer does better when the steer is fed on a legume hay than when the roughness is material like timothy, prairie hay, corn stover, or straw.

"Thus we have a four-fold profit from the use of one of these legume hays: First, in the form of cheaper gains; second, in the form of more rapid gains; third, in a higher finish and better selling quality; fourth, in the form of increased hog gains."

Of course, as I pointed out earlier, the effect of these leguminous crops on the land must also be considered. I don't mean to recommend this course as the best under all circumstances, but it is one of the two ways of profitably fattening cattle, and I believe that this question of the increased growth of leguminous crops is well worth considering as a means of supplying protein. The protein requirements of growing and fattening cattle certainly demand careful consideration. I simply want to impress upon you that it is profitable to supply a reasonable amount of protein so as to utilize the capacity for growth of these animals, and that under most conditions it would probably be to the advantage of the producer—the cheapest way of producing it—to raise this protein in the form of alfalfa or clover or other forage crops, rather than buy it at the ordinary market prices.

The President: Are there any questions you would like to ask Dr. Armsby? Please ask them at once, for we have a full program. I know the Doctor will be willing to answer them.

A Member: What is the effect of dried distillers' grains, as compared with dried brewers' grains, after the distiller has taken from the grain the rye whiskey?

Dr. Armsby: I don't carry the figures in my mind. In general, the rye grains are a little richer in protein than the brewers' grains, but I should say that there is probably not a great deal of difference.

The President: Any more questions? If not, we will proceed with the program. The next subject on the program is "Fitting Sheep," by Dick Stone. Mr. Stone will now talk to us.

Mr. Stone: I want to thank all the breeders and farmers for the treatment I have received at their hands. I feel like the old man some years ago I met in the lane near my house, stuck in the mud, and he couldn't get out. Of course, I unhitched my team and pulled him out, and after I had him out, the old man offered me some money; but, of course, I wasn't used to that; then as we parted he said, "My friend, I hope to God I'll see you in the same condition some day."

A few days ago I had a little talk with the farmers in our own county, and, of course, those papers always try to make the best of everything, so they said it was a model speech. Of course, when I went home, I swelled up a little, and I said to my wife how proud she ought to be to have such a man. Then my little boy, who was back in the corner, studying his lessons for the next day, piped up and said, "Papa, do you know what the definition of a model is?" Well, of course, I had to say "no." And then he said, "It is a small imitation of the real thing." And then I didn't feel quite so big over my speech.

And now, if you will bear with me a little while, I will get up and speak my little piece. After listening to the gentleman who has just preceded me—I don't understand what he said, having never been to school, but he tells me that they do here, and everywhere else, even down to Missouri, where they do the feeding—I'm a little timid about getting up, but if you'll bear with me just a little while, and then ask questions—for if there is any place in the world that I shine, it is right there, in answering questions.

FITTING SHEEP FOR SHOW AND FOR MARKET

By Dick Stone

A Show Flock is among the most interesting exhibits found at our State and county fairs, and shows the world over. And to the shepherds and many others it is a fascination. As I have often remarked the fitting of stock for exhibition often means a sacrifice of the cream of the flock. Nevertheless were the practice of showing discontinued it would be a source of loss to the live stock industry for the reason that the breeders would lose one of their best guides to type. Hence the show yard is a necessary evil. To properly feed and fit sheep for exhibition requires considerable skill. Where indifferent methods of fitting are employed not only are the animals' chances of victory poor, but their reproductive organs are liable to suffer in consequence. In feeding for the best results I feed concentrated foods, such as oats, oilmeal, peas and corn. Also the most succulent appetizing nutritious and cooling rations such as cabbage, rape, kale, turnips, mangolds and carrots, and these with the utmost regularity. After the preliminary or outdoor fitting the show yard candidates are housed during the heat of the day and allowed out in the paddock only during the night chiefly for exercise. Some little time previous to starting for the shows they are blocked out and trimmed and made very pleasing to the eye; after trimming they are blanketed with the purpose of keeping the fleece clean and making it compact and smooth. I always use a little color by mixing yellow ochre and burnt umber. Mix it with water and rub it into the fleece. It makes the sheep look fresh and nice. The question is often asked, How much do you feed your show sheep? The question is answered by saying we give them all they will eat, and sometimes a little more. In feeding our show lambs while they are sucking their mothers we make a creep for them to run in a little lot by themselves and feed the best we have—ground oats, ground corn with a little oil cake sprinkled with a little sugar. You cannot get your lambs too fat but you must watch your older ones or you will have too much blubber. The question is often asked me, when do you select your show sheep? Almost as soon as they are born, and if we never made any mistakes in our selections what a nice time we would have. I handle my show sheep as much as possible, as handling them makes them tame and manageable; although sheep are supposed to be a very dumb animal, there are a good many things that they learn very rapidly and one of them is how to stand out properly and how to follow the shepherd. A sheep is best made to stand squarely and naturally by putting the left hand under its lower jaw and the other on its loin and gently pressing it. As a natural consequence it spreads out its feet with a view of supporting the extra weight on its body. It takes but very little time for a sheep to learn what is expected of it and to acquire the proper pose and with your sheep properly fitted and with the expert judge you will come home with a good number of ribbons.

There is a vast difference in fitting for show and for market, one is only the fair and to be kept for breeding purposes, and the other is to be fitted for the market to be slaughtered. In the first place I would make my selection and it would be lambs raised somewhere in the West, sired by good pedigreed Down rams or some good western bred ewes with as much as possible Down blood in them. I would have them shipped in some time in August and let them run on the blue grass pastures and on the young clover as soon as they were rested. I would begin to feed about one-fourth of a pound of corn and would keep on by easy stages until they were eating one pound and a half of corn per day until about the first of November, and then I would bring them to the barn and shut them in and all the exercise tney would get would be to get water. I would give them a good feed of shock corn in the morning and good clover hay at night and make up the amount of corn to two pounds per day and occasionally give them a feed of oats. Be punctual about your feeding and you will find they have increased 10 to 12 pounds per month. We sow a good deal of rape in the oats and we find out to make money in our feeding operations is to feed the crops we can grow on the farm before we send them to market. We clip and straighten out the tail a little and if it is possible and we have the time we trim a little to please the buyer's eye.

My experience has been that a lamb will not pay for its feed after you have been feeding it all it would eat about 12 to 14 weeks. They cannot be forced to do any good after that time and as I suppose everybody is like myself—does the feeding for the purpose of profit. I tried this season on a seven weeks ration and sent them to show and market and while I won second they were three weeks behind and not up to condition as they ought to be, and therefore I had to be contented with second place. I have discovered the ewe lambs are much better feeders than the wether lambs, they rest more contented.

I love it, I love it, and who shall stop
Your bard from enjoying his mutton chop,
O, tender morsel grateful and cheap
From the loin of a good fat juicy sheep,
To my palate 'tis bound by a thousand ties
Of pleasant and succulent memories.
Which awake at the sight of a butcher shop,
For a sacred thing is my mutton chop.

I love it, I love it, let those who please
Enjoy a diet of nuts and peas.
Let Shaw compose his dramatic scenes
On cabbage, tomatoes and kidney beans.
Let Eustace Miles find muscular force,
In carrots, cutlets with plasmon sauce,
Or other equally messy slop.
But give me my old fashioned mutton chop.

I love it, I love it, and hail with glee
The sage remarks of Sir Crichton B.
A Daniel, A Daniel, to judgment come,
To right the wrongs of the injured tum.
To give the faddists who swear by greens,
A dose of metaphorical beans.
And like a thousand of bricks to drop,
On all who'd suppress my mutton chop.

The President: Now, gentlemen, don't be afraid to ask Mr. Stone any questions.

Mr. Bayard: A gentleman in the audience requests me to ask you the name of the medicated salt you fed your sheep.

Mr. Stone: Don't you know it? Doesn't he advertise in your paper? Well, I guess I'll have to give it to you: it's Holland's Medicated Salt, Wellington, Ohio.

Mr. Bayard: What about the old-fashioned mutton chop, I can't get them any more?

Mr. Stone: The reason you don't get them is because they're killed when they're lambs. Last year I sold the highest priced lambs that were ever sold in the United States, and I am proud to say that Pittsburg got them, and they've been selling them ever since, too. I got 11¼c a pound for them.

The President: What proportion of the exhibition sheep fail to be breeders?

Mr. Stone: Oh, I'm going to answer it, but I don't want to give myself away too bad. I want to say for myself that I have been very successful, and I think only about two per cent of the sheep I fitted for show were not breeders, and the reason they are breeders is because I do not fit them more than one year. It is very expensive to fit sheep for show. I believe that most people who fit sheep for show lose five dollars for every dollar they get out of the fair association. I said in my little article that we run the risk of losing the cream of our flock, because they are the only ones that will win. I am very careful and I keep my ewes from getting too fat, and I think I do not lose over two per cent of the sheep I fit, but there are a great many breeders who do not understand how to do these things, and they lose a large percentage of the sheep they fit. Our President here never sacrificed very many of his exhibition animals; he always sold them out at high prices before he got back here, and he really came back with money. After he was out there a few years we got the credit, but he had the combination.

Dr. Gay: Mr. Stone has been silent on the subject of breeds. I think the most important question is, what is the best breed and why? I know what the book says, but I would like to have Mr. Stone tell us why he prefers to breed the Oxford Down.

Mr. Stone: The reason I breed him is because I believe him to be the best on earth.

Dr. Gay: Why?

Mr. Stone: Because I get more pounds of wool from him than from any other. In this country, possibly, it is all right to breed the Merino. He lives on moss, but it seems to me that in some places he would have to wear off his nose looking even for it. Next to that I would have the Southdown. Because I have the Oxford is no reason why they are the best everywhere else. I would take the little Southdown. You don't have to pay tax in Pennsylvania, so you can breed what you please. The Shrop is not like the other sheep; most of them are good for one thing or another, either as wool-bearers or breeders, but the Shrop people have been breeding for their fancy points until they have about dropped out of the list. I think that perhaps we might get a good Oxford ram to temper them, and that way make something of them. Some of the other breeds like the Cotswolds and the Lincolns were all right when we lived in our little old log cabins, but that day has passed away, and the selected stock has come into use, and I don't see what is the use of these other breeds any more. There is very little meat on them, or wool, either. Now, if I had a mountain cabin I would have a small sheep. Our Oxford is too big, and has his feet too far apart to climb these mountains.

Mr. Bayard: How about the Dorset? You don't say anything about that.

Mr. Stone: Well, I want to tell you about that—Joe, will you say anything?

Mr. Henderson: Go ahead.

Mr. Stone: The Dorset is a very beautiful sheep, but you don't get very much wool from it, although you can raise a very nice little lamb. They are a very nice sheep to keep for a hot-house lamb. You can have lamb any time you want. The man who breeds hot-house lambs should have the Dorset. If I had them, I would ship the lambs to market as soon as they are weaned. Our breeders in England have the mothers shipped with them to London, and then have the mothers sent back. It is like Hackney horses that they drive around the square, just for show. The Dorset is all right, but I think the New York people can beat you raising him.

Mr. Bayard: What about the Tunis?

Mr. Stone: The Tunis is a very handsome sheep; he is ring-streaked with stripes. I think he was the progenitor of all others. We use the Oxford on the Tunis, and we find them red when they first come, but afterwards they are all colors. I have never fitted them.

Mr. Bayard: Mr. Palmer ought to stand up here. He uses Tunis.

Mr. Palmer: I don't see why I shouldn't. I'll stand by those colors.

Mr. Lantz: I would like to ask Mr. Stone why so many of the Oxford breeders are beginning to breed them like the Shrop. Why are they beginning to cover the head to make it appear like the Shrop? Another question: Can the Oxford lambs when six or eight weeks old be weaned from their mothers and raised on cracked corn fed them early in the morning and fattened for market?

Mr. Stone: I will answer the last question by saying I don't know. We have never tried it. I have never raised them for that purpose, and I can't tell. The other question I will answer by saying that there are fools in this business, as in any other. They are trying to breed for the fancy points that they think the people want. That is the trouble with the Shrop. I find that a great many breeders in England are trying to cover the face of the Oxford like the Shrop, and I think they are making a mistake.

Mr. Van Norman: How about the Cheviot?

Mr. Stone: It's a beautiful sheep, and I think will do better in Pennsylvania than almost any other breed. They are a mountainous animal, and will do well anywhere in the mountains, but if you have any niggers, you don't want to set them to catch the sheep; they never can catch them. But they are a beautiful sheep. They are like the Welsh Mountain sheep, and can live on almost anything, but after hearing the Professor tell how many tons he got from five acres, I can believe almost anything.

Dr. Gay: I simply want to say that we must get Mr. Stone to Philadelphia. He has never been East of Pittsburg, so he imagines that Pennsylvania is all mountains, but if we get him East to Philadelphia, we can show him Chester and Lancaster counties, and he will see some of the finest farming country in the world. The West has not got all of it, as he will learn.

But I want to say that he has brought out the point I wanted. As a matter of fact, I have been talking to my classes about sheep breeding in Pennsylvania, and of the various breeds adapted to these localities, but I have never been able to make absolutely sure of my ground, and I wanted to see what the breeders had to say in regard to it. It seems to me that Mr. Stone has answered my questions very well. I don't like to hear him talk about our mountains, though, with the inference that we have all scenery and no farming land. We have one county in this state that excels many states in the Union, and can compare favorably with the best of them, not even excepting Illinois.

Mr. Stone: I have passed through this state in going to New York, and when I stopped at Philadelphia, I began to think I was mixed up with Boston, for I began to think Philadelphia had the beans.

Now, I have seen that fine farming country of yours, and I would like to sell you a few Oxfords just to show you how good they will do. They will thrive on the lowlands, but on the hills they won't do well. The Shropshire is the same. In fact, none of the heavy breeds wants to climb the mountains. It takes a light sheep to do that.

Mr. Lantz: I don't want to interrupt you, Mr. Stone, but I would just like to emphasize the point which Dr. Gay brought out. Now, if the Oxford came to Chester and Lancaster, we would get a good combination with the Shrops, they would come into competition.

Mr. Stone: They'll hold their own, never you fear.

Mr. Lantz: I have had fifteen years' experience breeding Shropshires on the Eastern slope of the Alleghany mountains, about fifteen hundred feet above sea level. After that I had six years' experience breeding them in Chester county, about four hundred and eighty feet above sea level, and I find that the Shrops have done a great deal better in the low lands than in the high region. Therefore I think that the Eastern section is more adapted to the heavier breed of sheep. The idea of having high-lying, hard land for sheep is wrong. I am glad to see Dr. Gay advocating sheep-breeding for Eastern Pennsylvania. There is really no better sheep raising country anywhere than that of Eastern Pennsylvania, lying four to five hundred feet above sea level.

Mr. Stone: I don't recommend any man who has the Shrop to change to the Oxford. You have to follow your own fancy more or less in the breeding of sheep. I have brought all the breeds across the sea, and I have tried them all, and each one has his own peculiar points of excellence. If I had a flock of Shropshires I would not exchange them for anything else in the world. My wife says—and she is a Pennsylvania Dutch woman, and she ought to know—that I am the most obstinate man she knows; that I always will have my own way. I have seen changes made all over the world, and they are all for the better, except possibly in the case of the Shrop when they breed him for fancy points, and they will continue to improve and become better as time goes on, with the exception of possibly the Southdown and the Oxford; they won't get any better because they are already as good as they can be. But when they breed the Shrop for fancy points, I think they are making a mistake, and unless this breeding for the woolly ear and covered face is stopped, I know that the next two or three years will see a class of Shrops with a big upstanding ear. Now, their ears are so small that you can't see them at all, and we'll have to go back.

Mr. Wagner: Where do you consider the difference lies between the Oxford and the Shrop?

Mr. Stone: Well, I'll tell you—you take a little—well, I see you have asked that question about different points.

Mr. Bayard: This is where you shine, you know.

Mr. Stone: Oh, I'm going to shine, all right, and I'll try to answer that question, too, but I don't want to hurt the feelings of the Shropshire men.

Now, a year or two ago, a few of us got together in Chicago, and we talked of the different varieties to make the most money. I contended that the Oxford was the best for taking out on the plains, and I offered them to send ten rams to the West, and let the others do the same, and then let the lambs come back to Chicago. Well, Nolan took me up, and he took the three varieties, the Oxford, and the Southdown and the Shropshire. A year ago last August he shipped them back to Chicago, and they carried out my idea exactly. Those Oxford lambs brought 60 cents per head more than the other varieties. That satisfied me, if I had not been satisfied before, that they were the best sheep, and the best shearers, and the best money-makers.

Now, when it comes to winter lambs, I would not have the Oxford, because they will not mature like the lighter breeds will. On the farm, you know, we want those that will weigh 425 pounds before they are two years old. The highest I ever had weighed 450 pounds, but many times I have had yearling ewes that will weigh 300 pounds, and I get from three to five pounds more wool than the Shrop gives. That is the difference. They sell at the same price on the market, but the Shrop will fail you when it comes to the wool. We take these lambs and feed them up after we have sheared them, and then the Pittsburg people give us 11¼c a pound for them.

Dr. Hunt: What were they crossed with?

Mr. Stone: With Merino ewes.

A Member: Do the markets of this country really want 400 pound sheep?

Mr. Stone: No, sir; and not very many of them go to market.

A Member: What is the average weight of your fleece?

Mr. Stone: Well, I have been looking over my account book for the last thirty years, and taking into consideration that I have a great many old ewes on the farm, I find that I have never been below eleven pounds on the whole flock, and never reached thirteen, so it is about twelve pounds on the average.

A Member: What would you do with the dog? You see we have a great many dogs in Pennsylvania; perhaps that accounts for the fact that we do not have more sheep.

Mr. Stone: Well, I'll tell you what I do about dogs. No man in the world loves a dog better than I do, but I love him dead. I am very kind to them. I never shoot them, but you know a dog is very fond of beef, so I put a little strychnine on the beef and put it away in my pocket, and when I see a dog I don't like, why, I just feed him. Sometimes there is quite a corner in dead dogs in my country. I had a flock of $1,700 worth of sheep destroyed in one night by the dogs, and I swore vengeance on the dog.

Dr. Gay: I don't want to take up too much time, but I am interested in sheep, and I have a very high regard for the opinion of Mr. Stone. I wish he would tell us something about the different varieties of sheep, particularly the Oxford and the Shropshire.

Mr. Stone: I brought some of the Shrops west with me, and, of course, I have a high regard for them, but I prefer the Oxford. He is a better wool-bearer. Of course the Oxford is a recent breed, but if the Shropshire people get the idea into their heads that the Shrop is a much older breed, they are mistaken. There is not two years difference in their introduction, and their presentation to the Royal Shows of England.

Dr. Gay: That is the impression they gave us, that these sheep were introduced quite recently, to meet the market demands.

Mr. Stone: Certainly, sir; if you look at it from an Oxford point of view, you will find that what I tell you is so. You will also find this: that in Germany the people will not buy any breed of sheep except the Oxford crossed with the Merion, and they cross with the Merino better than any sheep on earth.

A Member: Will Mr. Stone please tell us the age of the lambs for which he got 11¼c?

Mr. Stone: They were lambed in March and shipped in November. They weighed a hundred and ten pounds, and never had any corn until after August.

I want to say that I had a very hard time coming down over these mountains, but I will have a very good report to take home to my wife of this meeting and the people here.

The President: We will now be addressed by Dr. Pearson on "The Pennsylvania Meat Inspection Law." I now have the pleasure of introducing Dr. Pearson.

THE PENNSYLVANIA MEAT INSPECTION LAW

By Dr. Leonard Pearson

The last time I had the pleasure of meeting Mr. Stone was at George Adams' at Farringdon, in Berkshire, England. He was over there buying rams. He got the best the breeders in England had, and after watching him make that trade, if I had not known he was an Englishman, I might have thought he was a Hebrew.

Mr. Stone: America demanded of me to do my part.

Dr. Pearson: You did it, I can say, and you took away that year some of the best the breeders of England had.

I can't let this opportunity go by without saying something about the general status of the agriculture of Pennsylvania. Some remarks made by Mr. Stone would indicate that he thinks our land is all stone, but as a matter of fact, we have some of the best agricultural land in the United States. Now, when Mr. Stone crossed the state, he did so on the Pennsylvania railroad, which shows beautiful scenery, but it does not show all of the good agricultural land of the state. It is not until you are east of Harrisburg on that line or until you cross the state from the north to the south, that you realize our farming possibilities. As Dr. Gay has said, the agricultural products of Lancaster county alone are nearly as large as those of some states; they amount to ten million dollars a year. There are only thirty-four counties in the entire United States that produce more than five million dollars worth of farm products a year, and out of these thirty-four six are in Pennsylvania.

Just a word in regard to an important topic that has been referred to here, to dogs. I have been brought in contact with the dog question in a very direct way in connection with outbreaks of rabies. There has been a good deal of this disease in Pennsylvania. In many cases it has become necessary to quarantine the dogs in a district, and it is only where such a quarantine is established, that you find out how many dogs are practically ownerless, dogs that no one cares for and that are essentially wild animals. The Legislature has made an appropriation of $50,000 to cover bounties paid on wild animals. It seems to me that it would be more useful to the state to pay bounties on wild dogs than on wild cats, weasels and minks. Perhaps wild dogs could be included under the operation of that law.

A dog law was enacted by the last Legisture which provides that the commissioners of each county shall provide metal tags, to be given to the owners of dogs when the tax is paid. This tag is to be attached to the dog's collar. The amount of the tax is not established by the state, but is determined by each county. Every dog not wearing such a tag may be shot by a constable, after due notice and after a certain length of time. But, unfortunately, this law is a dead letter in many counties of this state. In fact, I do not know of one county in which it is carried out fully. In some counties the commissioners have deliberately agreed to disregard the law, and have refused to buy the tags.

Mr. Wagner: Can they compel the constable to go around and lock up the dogs?

Dr. Pearson: I don't think they can without the initiative having been taken by the commissioners.

Mr. Wagner: In our county they furnish the tags, but possibly not one-third of the dogs are tagged.

Dr. Pearson: If the commissioners furnish the tags, then it is up to the tax collectors and the constable to enforce the law.

Mr. Wagner: But the question is, how to compel them to do so.

Dr. Pearson: One should get an order from the Court.

I am to speak to you this morning on the subject of "The Pennsylvania Meat Hygiene Service." A State meat hygiene service is new in this state, and, indeed, in the United States. Pennsylvania is the first state to do anything important with regard to meat inspection, but now it seems to be probable that the meat inspection movement will spread over the entire coun-

try, very much as the pure food movement has.

While the meat hygiene law is new, the idea of meat inspection is by no means new. The Jews had a meat inspection law laid down by Moses, and it is most interesting to study these regulations, and how they have continued to enforce them, and how the Jews have profited by them. It is well known that the Jews have lived under very adverse conditions. They have been forced into ghettos; they have been poor, and have lived in crowded tenement houses and have lived as cheaply as possible, and yet, they are today one of the healthiest races. In the crowded tenements of Philadelphia and New York, and other large cities, tuberculosis has a strong foothold, and it carries off a very large proporportion of the unfortunate of the poorer classes; yet the proportion of Jews who die of tuberculosis, living in the same conditions as these other people live, is less than one-third—usually about one-fourth of the average percentage. Although the Jews are a small people physically, they are well developed, and when they are well fed, they are strong and hearty. It is well known that the Jews of Russia and Poland have developed in this country a people very much in advance, physically, of their ancestors; and it is believed by these people that the care of the Jews regarding their food, especially their meat supply, is largely responsible for the health and longevity of the race. Of course, too much stress must not be placed on this, but no doubt, it is one of the important influences.

In this country, it was not until relatively recent times that anything was done regarding meat inspection by the U. S. Government, and it is a well known fact that it was in connection with questions as to meat prepared for export that the Department of Agriculture was obliged to first take part in this work. The action of other countries in regard to the meat coming from this country, was largely responsible for such action. Meat for export purposes had to be inspected, and gradually the idea obtained that it was not a proper thing, either hygienically or ethically, to inspect the meat shipped to other countries, and allow our own people of the United States to use the meat that they rejected. So, by a process of development, considerably accelerated of late, the meat inspection law now covers all the details of the operation of certain packing houses. Under the new law, all slaughter houses, packing houses and meat canneries that are engaged in interstate or export business, are subject to federal inspection. This means that packing houses cannot sell their products in a state other than that in which they are located without the stamp of approval of the United States Government. But, so far as an individual state, for example, the state of Pennsylvania, was concerned, any meat prepared in an establishment engaged in trade wholly within this state, whose products are sold only in the state, could not be inspected by a United States inspector, and so the consumer had no assurance that the animals killed were sound and free from disease and that the meat was properly handled. And in this state we get a large part of our meat supply from such local establishments. I don't know how many local slaughter houses there are in the state, but there are one hundred and seventy in Philadelphia and a hundred or more in Pittsburg, and scattered all over Pennsylvania, in the smaller towns and rural districts, there are small slaughter houses engaged in local business. Until the new State Meat Inspection Law was passed, these houses were under no supervision whatever.

Now, it is important from two standpoints that these houses and their products should be supervised, first, from the standpoint of public health, and second, in the interests of the meat producers of Pennsylvania. If pure food laws and hygienic conditions are of any importance at all, they are of the very highest importance with respect to our meat and milk supply, so that from the standpoint of public health, it is urgently necessary that these local slaughter houses shall, so far as possible, be placed under the same kind of supervision as the packing houses engaged in interstate and in export trade. Then, on the other hand, it is important because the people are rapidly learning the significance and the advantage of the mark of the federal meat inspector, and are beginning to refuse to buy meat from establishments without competent inspection. Now, as that sentiment grows, it is at the expense of the local slaughterer, and unless his establishment has reliable inspection, he is at a disadvantage, and this disadvantage will grow until at last he will find himself able only to sell to the least desirable trade in his community.

The State Meat Hygiene Law is Act No. 187, approved by the Governor, May 25th of last year (1907). It provides for the appointment of ten agents, under the supervision of the State Live Stock Sanitary Board. These agents go from place to place as they are assigned, for the purpose of examining slaughter houses and butcher shops in any part of the state. Now, of course, it is not possible for ten men to cover frequently and systematically each locality of the state; the area is too large; but still they are a very effective aid toward bettering conditions in the local slaughter houses of the state and have accomplished a surprising amount of good.

I don't think it is necessary to describe to you the conditions in some of the local slaughter houses. You have no doubt seen some of them and may have been disgusted by what you have seen, and no benefit is to be derived from repeating that feeling of disgust. Some of them, as you know, have been conducted in the most disreputable way, and these disreputable establishments have been competing with the slaughterers who have been trying to furnish pure meat to their customers. If, for instance, there is in a locality a certain slaughter house which slaughters diseased animals, and sells them at the lowest possible price, of course, such a man will be able to undersell the man who slaughters healthy animals and keeps his place in first class condition. It is partly for the purpose of protecting the reputable slaughterers that the meat hygiene service is being conducted.

It is important for the meat producers of Pennsylvania that this shall be done. The farmers of Pennsylvania have a large supply of meat-producing animals, but this supply should be larger. It is essential for the producer in Pennsylvania and for the growth of meat production that there be a good home market for these animals. We cannot have a good local market for them unless they are strong, reputable business men engaged in the local slaughtering trade.

And a fair amount of competition is necessary so that the producer can get a good price for his product. In other words, the local market for meat producing animals is bound to decline if the local slaughtering business declines. Hence, it is not alone to protect the slaughterer, but to protect the farmers of the State, that this meat hygiene service is being conducted.

Just what, or how marked, the effect will be, cannot yet be said. The law has been in operation only a short time. There already is a spirit of encouragement among the better and more progressive element of the trade as a result of the work that has been directed against unclean and disreputable establishments. Many of the better local slaughter houses are enlarging, improving and are preparing to do more business. All of the results so far are in the interest of the public health and the local meat-producer—the interests we wish to conserve and advance.

The President: Are there any questions you would like to ask? I know that Dr. Pearson will be glad to answer them.

I think there are a good many in the house today who are not members of the Association. Mr. Lantz, the treasurer is here, and Mr. Bayard the secretary, are here or Mr. Palmer—any of them will be glad to take your money.

Mr. Bayard will now announce the prize corn.

Prize Yellow Dent.

1.	Burton Bayard, Waynesburg, ...	No. 57
2.	George W. Gordon, Waynesburg,	No. 59
3.	J. B. Henderson, Burgettstown,	No. 77
4.	Lyle S. Walker, Hanlin Sta.....	No. 53
5.	J. G. & J. A. McSparran, Furniss,	No. 44
6.	James M. Paxton, Houston, ...	No. 75
7.	G. A. Trimmer, Mechanicsburg,	No. 12
8.	W. F. Wagner, Harrison City,..	No. 72
9.	John S. Weaver, Kinzers.....	No. 20
10.	Henry Mesta, Finleyville,.....	No. 60
11.	C. L. Taggart, Washington,.....	No. 63
12.	Sam'l H. Broomall, Cochranville,	No. 50

Prize White Cap.

1.	J. P. Dentler, Turbotville,.....	No. 52
2.	W. A. McCoy, Mercer,.....	No. 80
3.	J. Kid Ritenour, Uniontown,.....	No. 3
4.	Joseph C. McCann, Fredonia,.....	No. 8
5.	F. W. Levis, Wingohocking,.....	No. 16
6.	Sydney T. Isett, Spruce Creek,...	No. 48
7.	——— Tullytown, ...	No. 14
8.	F. W. Levis, Wingohocking,.....	No. 17

Prize White Dent.

1.	Lee L. Trimmer, (11 years old) Mechanicsburg,.....	No. 13
2.	Julius Le Moyne, Washington,....	No. 64

Sweepstakes Prize.

Burton Bayard, Waynesburg, ... No. 57

Best Ear Prize.

Lee L. Trimmer, (11 years old) Mechanicsburg, ... No. 13

Largest Ear Prize.

F. W. Levis, Wingohocking,..... No. 18

Boys and Girls Best Ear.

Lee L. Trimmer (11 years old), Mechanicsburg, ... No. 13

Freak Ear Prize.

——— Tullytown, ... No. 89

Flint Corn Prize.

John G. Ayers, Gillette, ... No. 49

Mr. Bayard: I want to say that this corn will be sold at auction this afternoon, as usual.

Does anybody want to ask Dr. Hunt any questions regarding corn?

Dr. Hunt: I would like to say just this: that for this year I think the exhibit is unusually fine. Of course, this a bad year for corn. Perhaps another year, with similar seed we might outrun it, but taking everything into consideration, I think this is a good exhibit.

The President: If any one has any resolutions to offer, please hand them in to Prof. Van Norman during the noon hour.

Any further remarks?

Mr. Clark: What hour will the election take place?

The President: At the opening of the afternoon session. We have a full program this afternoon, and I hope every one will be on hand at once. We now stand adjourned until half past one this afternoon, at which time the corn will be auctioned off.

THURSDAY, FEBRUARY, 6, 1:30 P. M.

Before the formal opening of the afternoon session, a photograph of the Association was taken for publication in the Sunday papers, after which the corn auction took place, Mr. Bayard acting as auctioneer. Following this, the President took the chair, and the business of the afternoon began.

The President: The meeting will please come to order. We will first take up the reports of the different committees. We will now have the report of the Auditing Committee.

Mr. Shoemaker: We have gone over the books of the Association, and find the accounts correct.

The President: You have heard the report of this Committee; what is your pleasure?

A Member: I move it be received.

This motion was regularly seconded, and carried in the usual way.

The President: The next thing on the program is the report of the Committee on Resolutions.

Prof. Van Norman thereupon reads the following resolutions, which were adopted section by section on motion of Prof. Van Norman, the last resolution by a rising vote:

Whereas, there are many local organizations interested in the Live Stock Industry, whose members are unable to attend the meeting of the Association, therefore,

Be it Resolved, that any such organization may become a member of the Pennsylvania Live Stock Breeders' Association for the calendar year on payment of one dollar, and may have listed as associate members of the Live Stock Breeders' Association, its members on payment of twenty-five cents each and such associate members should receive copies of the Annual Report and other printed matter, but shall not be entitled to vote, hold office, or be listed under "What we breed."

Whereas, As a great State Fair would bring to a central point the best herds and flocks of the country at large, animals of a class that are not attracted to local fairs, and

Whereas, such a fair is a great educational influence, not otherwise provided for, therefore be it

Resolved, That it is the sense of this Association in annual convention assembled,

that the State of Pennsylvania should have a State Fair, to be made possible by state appropriation, and that the Commission of Managers should be composed of practical men, representative of this and similar organizations.

Whereas, At our last annual meeting a resolution was adopted urging the Legislature to make increased appropriations for the further building up and support of the Agricultural Department of the Pennsylvania State College and of the Veterinary Department of the University of Pennsylvania, therefore be it

Resolved, That we express to the Governor, and to those members of the Legislature who worked to this end, our hearty appreciation of their efforts.

Whereas, We, the Pennsylvania Live Stock Breeders, in annual convention assembled, learn that every speaker who has addressed this convention, has come to us without compensation for time or effort, therefore be it

Resolved, that we hereby express our sincere appreciation of their generosity and the intrinsic value of their instruction.

Whereas, Dr. Thomas Turnbull has generously contributed a silver cup to be awarded to the exhibitor showing the best ten ears of corn, be it

Resolved, That the thanks of this Association be and hereby are extended to Dr. Turnbull for this public-spirited and helpful donation.

Whereas, This Association is indebted to the Secretary of Agriculture of the Commonwealth for financial assistance in carrying on the work of the Association, therefore be it

Resolved, That we the members, in annual convention assembled, express to Secretary Critchfield our appreciation of this assistance.

Whereas, The President of this Association, Hon. W. C. Norton, has labored earnestly on every possible occasion for its interests, and especially for the State Fair project, be it

Resolved, That we acknowledge our indebtedness to Mr. Norton and extend to him this evidence of our appreciation of his service.

Whereas, Our retiring Secretary, Mr. E. S. Bayard, has worked with great earnestness and success for the upbuilding of this Association, and for the advancement of the breeding interests of Pennsylvania, be it

Resolved, That we hereby express our appreciation to Mr. Bayard for his work, and for the results that he has been instrumental in producing.

Whereas, Death has called from his labors our highly esteemed member, T. E. Orr, therefore be it

Resolved, That the Pennsylvania Live Stock Breeders' Association, in annual convention assembled, recognize the severe loss it has sustained in the death of Mr. Orr, a man whose genial disposition and grand character will long be remembered, and a man whose influence for the upbuilding of Pennsylvania Live Stock will be at work after the wounds in our hearts are healed.

The President: Next comes the report of the Committee on Nominations.

Mr. Powell reads the following nominations made by the Committee:

President, Hon. W. C. Norton, Aldenville; Vice President, Dr. Leonard Pearson, Philadelphia; Second Vice President, M. P. Shoemaker, Greensburg; Secretary, E. S. Bayard, Pittsburg; Treasurer, J. F. Lantz, Wyebrooke.

Executive Committee: W. G. Powell, Shadeland; M. N. Clark, Claridge; D. Norman App, Selinsgrove; Lee R. Scott, Burgettstown; George C. Watson, State College; James Blair, Hartstown.

Legislative Committee: Hon. W. C. Norton, Waymart; E. S. Bayard, Pittsburg; Dr. Leonard Pearson, Philadelphia; Dr. Thomas Turnbull, Allegheny; H. W. Comfort, Fallsington; R. L. Munce, Canonsburg; J. H. Reichert, Scranton; S. E. Nivin, Landenberg; Henry Palmer, Avondale.

Transportation Committee: T. D. Harman, Pittsburg; Dr. J. Cheston Morris, Philadelphia; W. F. Shrum, Adamsburg; James T. Fleming, Belleville; J. Grier Dain, Malvern.

Committee on Fairs: W. C. Black, Mercer; James Blair, Hartstown; J. L. Henderson, Washington; J. D. Detrich, Flourtown; L. D. May, Granville Centre; W. E. Perham, Niagara.

Mr. Powell: Your committee now asks that these names be placed in nomination.

Mr. Cowan: I move that we accept the report of this committee and let Prof. Van Norman cast the ballot.

This motion was duly seconded and carried.

Prof. Van Norman: I beg to call attention to the fact that Mr. Watson is no longer at State College.

Mr. Clark: We understand that he is on a vacation and will return, so we have put him on.

Prof. Van Norman: As the President is one of the officers nominated, it will be impossible for him to cast the vote. I therefore take pleasure in casting the ballot for the gentlemen placed in nomination by the committee.

Mr. Norton: I thank you heartily for this new mark of your confidence in me, and I ask your help in furthering the interests of this Association. I can do little alone, but if the men here, and the men from the East will all fall in line, we can work wonders for the Live Stock interests.

THE PENNSYLVANIA STALLION LAW

By Professor Carl W. Gay

Mr. President and Gentlemen: I am very glad to have this opportunity of addressing you on a subject of much importance to a great many of us. This is your law, originating in your Association and passed very largely through the effort of its members, therefore I want to discuss it with you and know to what extent its operation, to date, meets with your approval.

By the act of the legislature which was approved by the Governor the 25th of last April the stallion owner is required to do more than to simply record his horse with the prothonotary as has been the case heretofore. Since January 1st it has been required by law that every stallion for whose service a fee is asked must be enrolled with and secure a license certificate from the State Live Stock Sanitary Board.

The experience of the past two months seems to indicate that the things required of the stallion owner before he can secure a state license are not well understood. It is not a mere matter of registration for which simple application is all that is necessary. There are certain conditions prescribed by law which must be met and failure to meet them may result in the applicant being refused a license. Furthermore these requirements being fixed by law must be strictly adhered to and there can be no exceptions made of individual cases.

The first thing necessary in making an application for state stallion license is to give a detailed description of the stallion: age, weight, height, color and markings. This is necessary for the purpose of identification and also for the reason that it is incorporated in the license certificate. Any omission will appear there. The next essential is the original pedigree registry certificate. The license certificate, which is issued indicates whether a horse is "pure bred," "grade" or "cross bred," and the wording of these certificates is established by the law. The "pure bred" license certificate states the horse to be registered with an Association recognized by the United States Department of Agriculture, therefore the certificate of such associations is the only authority upon which a "pure bred" license can be issued; furthermore it is necessary to see the certificate itself and not a copy, in order to establish the fact that the horse for which application is made is identical with the horse whose registration is reported. It is very important to have all transfers of ownership properly shown so that the present ownership of the horse may be confirmed. Unauthoritative tabulated pedigrees and advertising matter cannot be accepted for the issuance of a "pure bred" certificate. Any certificate or statement of pedigree must be properly authorized by officers of the Association which issued it and this must be an association which itself is authorized by the United States Department of Agriculture. The term "grade" as used in connection with these license certificates has a very broad meaning and includes all animals not fulfilling the requirements just set forth as necessary for a "pure bred" certificate, with the exception of a small group whose sires and dams are both pure bred and properly registered but in associations of different breeds; to these are issued the third form of certificate designating them "cross bred." Unfortunately there can be no discrimination so far as the wording of the "grade" certificates is concerned, between that issued to the horse whose eligibility to registration is denied only on account of an untraced third or fourth dam and the horse of the most mixed or nonedescript breeding. The clause "not of pure breeding" which appears in the grade certificate should therefore be interpreted "not registered."

The third requirement is a fee of $2.00 which is necessary in all cases whether an animal be pure bred or not. This money is immediately turned over to the State Treasurer and no license can be issued until there has been a $2.00 remittance to cover it. Finally some certificate of soundness is demanded and this may be the sworn certificate of a qualified veterinarian licensed to practice in the Commonwealth of Pennsylvania or the owner himself may make affidavit that after diligent inquiry he believes his horse free from hereditary, contagious and transmissible unsoundness and disease. Unsoundness or disease of an hereditary nature will disqualify a horse for breeding purposes.

If you, the stallion owners, have fulfilled your part to the letter there will be issued to you a state license certificate certifying to the description, breeding and soundness of your horse and authorizing him to be used for public service in the Commonwealth of Pennsylvania.

The conditions that brought this law into effect:

It is a well known fact that Pennsylvania consumes as many horses as any other one state with perhaps one exception while in the matter of production she stands away down on the list. Inquiry into the matter leads me to believe that the production of horses is less than it was ten or fifteen years ago with no improvement whatever in the class of horses. I have been told by some of the largest dealers in the state that it is impossible to secure anything like an adequate supply of horses of the quality, type and breeding which they require without going to distant states, although they would prefer to patronize the home breeders and are interested in improving the class and number of horses produced in this state. There can be no question that an increased activity in the horse breeding industry in this state would not only improve the number and sort of horses here, but would be found a source of profit to those engaged in it. I know that there will be exception to this statement made on account of the fact that we cannot compete with the western farmer, who can undersell us and thus get our trade. So far as economy in production is concerned, together with the selling price on the farm, this is undoubtedly true, but in view of the fact that the majority of the highest class horses come east and that eastern buyers in the west always allow a liberal margin to cover the cost of getting these horses on eastern markets, our closer proximity to these markets will be found to offset to a considerable extent the advantage enjoyed by the western farmer in first cost of production. At any rate the question is not so much "Can we compete with the western horse raiser" as it is "Can we not find it to our advantage to raise more and better horses."

Three things may be charged as responsible for the lack of progress made in the horse breeding industry in Pennsylvania in recent years. The first is the evident lack of a clear conception of what constitutes a good salable market horse. The second is an absence of good blood which may be expected to bring about improvement or the indiscriminate use of what little good blood is already available, while the last and perhaps the most serious condition responsible for the present state of affairs is the persistence of the breeder to patronize the cheap, inferior sire and his failure to manifest any disposition to patronize well bred horses of desirable type at the higher fee which their greater cost makes necessary.

Much may be done in correcting ideals and spreading general information concerning the market types of horses, by the county fair associations. I would emphasize the importance of show ring awards as educational features. Successful competition in the show ring would not be regarded as simply a means of distributing ribbons and cash prizes but as setting forth the most desirable types for the benefit and edification of the breeding community. A com-

prehensive classification of entries followed by consistent and accurate awards based on that classification, will do much to raise the standard of the live stock produced in the community. Not until we have higher ideals and a more liberal view of the breeding business is taken can we expect many horses of approved type and breeding, to be offered to our breeders. Some men have objected to superior stallions being brought to this state until we have on our farms a class of mares better adapted to give most satisfactory results in mating with these horses. However much we appreciate the importance of the dam in determining improvement we must admit that improvement in a far greater number of individuals will follow the use of a superior sire than when the dams only are of improved character. Grading up is the best means of improving our farm mares and the most important factor in the grading up process is the pure bred stallion of superior type, conformation and breeding. It is for this reason that the first step to encourage horse breeding in Pennsylvania has been directed to the stallion, by regulating the services to be offered to the breeding public.

We have just reason to feel proud of the achievement of our American breeders but we must admit that most systematic improvement in the production of horses is to be noted in Great Britain, France, Germany and Belgium. In all of these countries the work is more or less under Government control and patronage and the methods involved pertain, first of all, to the regulation of stallion service. This system is most complete and effective in France where all horse breeding is under direction of the Director General and all horses whose services are offered to the public have passed a system of government inspection. They are first certified free from roaring and periodic ophthalmia or moon blindness, which are the two conditions constituting hereditary unsoundness in France. After being certified sound by the veterinarian, the branded star on the neck being the stamp of such certification, they are turned over to the inspectors who classify them according to merit. First of all it should be remembered that a large number of the stallions used for breeding purposes in France are in Government studs. Of those owned by private individuals three classes are made by the Government officials. The first class is designated "approved," and represents those of most superior type and breeding, the patronage of which is especially commended, in fact, the owners of these stallions are paid an annual subsidy by the government making it possible for them to stand at such a fee as to place their services within the reach of most breeders. The second class consists of those stallions which are not quite up to the standard of "approved," but which are nevertheless useful breeding horses. These receive no subsidies but have the authority of the government to stand for public service and therefore are termed "authorized." In the third class are those horses of no especial merit but which are allowed to remain in the breeding ranks on account of the fact that they have been certified to be sound. This class is therefore designated "certified." Any stallion which is neither owned by the Government nor inspected by Government officials and classified in one of these groups standing for public service in France does so surreptitiously.

Following the precedent of France some of the Canadian Provinces and Wisconsin, Minnesota, Utah and Iowa of the states have taken up the matter of improvement in horse breeding and have passed laws regulating the service of stallions. The passage of similar laws is at this time being contemplated in the state of New Jersey, Ohio, Kansas and Indiana, the indications being that there will eventually be uniform laws in the majority of the states controlling this phase of horse breeding.

There seems to be very little question of the benefits to be derived from the operation of a law of this sort, although I am aware that some criticism is made of the means taken to attain the desired end. It should be borne in mind by those disposed to doubt the wisdom of the parties responsible for the form of the present Pennsylvania law that at best a radical measure and sudden enactment will bring to an abrupt ending the practices of certain men who have suffered no interference whatever for years and even generations. The enforcement of laws is usually intended to drive rather than lead, yet there is much of an educational nature about the successful administration of the law in question. It was necessary that the act be originally framed in such a way as to make its immediate operation possible with beneficial results, at the same time avoiding such opposition as might, in the first place, prevent its ever becoming a law or make impossible its administration in case it passed the legislature. The two points most commonly assailed are those pertaining to the licensing of other than pure bred stallions and the issuing of licenses on the basis of the owner's affidavit of soundness. In defence of the first it may be said that it would be practically impossible to retire from the service at this time all but pure bred stallions in the state of Pennsylvania. While the grade sire as a rule is an uncertain proposition, his patronage to be discouraged, there are undoubtedly many useful sires now in service for which a pure bred state license certificate could not be secured. What the law does do is to prevent misrepresentation in the matter of a horse's breeding thereby creating a sentiment in favor of the pure bred horse which may eventually result in his being the only one authorized by the State Department of Agriculture. It was necessary to accept the owner's affidavit of soundness on account of the fact that in some counties there are no qualified veterinarians and to demand a veterinarian's certificate of soundness would be to impose the next thing to an impossibility upon the owner. No doubt this privilege is sometimes taken advantage of but those cases will usually be found to work themselves out to a satisfactory adjustment. The time will probably come as it has already in Wisconsin and Minnesota when the owner's affidavit will no longer be accepted. The law as it now stands must not be regarded as final but subject to amendment from time to time. While purposely made rather open to begin with there may be a gradual tightening up as time goes on and its administration shows up certain changes which could be made to advantage. Now I have left for consideration one matter which I would like to hear discussed at this meeting. Our law makes provision for a special certificate of approval to be awarded after the French custom to horses of superior type, conformation and breeding. We have received a number of applications for these special certificates but as yet none have been awarded for the reason that a system of making these awards which of necessity must be uniform, has not been satisfactorily worked out. It is proposed to organize in the various counties or breeding districts, stallion parade associations whose main object shall be the holding of an annual exhibition of all breeding horses in that locality. This would result in all eligible horses being centralized at a given point when the award of a special certificate of approval could be conveniently made. The judges, however, who are to make these awards should adhere to a uniformly high standard of excellence in order that these certificates may have the same significance no matter where secured. The ideal system would be that which admitted of all awards being made by a commission appointed for that purpose, however, since the territory to be covered is so great and the funds available for this work so limited such a system does not seem possible at this time. In Canada where these shows have been held with marked success two judges, one a veterinarian, are appointed in each district.

The objection may be raised, that such a plan would necessitate taking the horses a long way from home thereby imposing some expense upon the owners; but this very thing would have the desirable effect in that it would result in only those horses which were very certain to receive recognition being presented for the special awards. It has worked well in other countries and as much may be expected of it here.

In conclusion, gentlemen, I would like to ask your co-operation in the administration of this state stallion law. Consider its intent rather than the present form which is subject to modification, as suggested by you, at each subsequent meeting of the legislature. The first step necessary in the enforcement of this act is to reach every stallion owner in the state with a notification of its existence and his obligations to it. In many cases it is then necessary to explain more in detail some of the provisions of the act which may not be well understood. In both of these essential steps you members of the Pennsylvania State Live Stock Breeders' Association can by your co-operation aid matrially in securing the results which it is hoped to attain and it is with that fact in view that this matter has been discussed before you today.

The President: Any questions?

A Member: If I understand the gentleman right, the owner must absolutely receive the certificate from the Association in which the horse is registered. When we purchased our horses, we were informed by the importing company that no duplicates could be procured.

Dr. Gay: Yes; we assume the responsibility for that certificate after it is sent us; if your horse is registered, send us the certificate of the Association in which it is registered, and we will assume the responsibility of getting it back to you in as good shape as when you sent it. Duplicate certificates are issued by most associations upon satisfactory proof of the loss of the original and receipt of an additional fee.

A Member: Is there a renewal every year, or does one certificate answer?

Dr. Gay: A renewal very year.

A Member: Is it necessary that the horses be examined every year?

Dr. Gay: Yes, sir; it is.

A Member: What constitutes hereditary unsoundness?

Dr. Gay: In Wisconsin they have stated in their law what constitutes hereditary unsoundness. In this state it is left to the discretion of the man who examines the horse. A horse may be subject to deformity in structure, or weakness in some vital part, or it may have simply a predisposition which will develop later. At the present time the matter of what constitutes hereditary unsoundness is left to the judgment of the veterinarian. It is a matter of discretion on his part at present, but if there is demand enough, I have no doubt that in time the law will cover that point.

A Member: In order to get a prompt return, what is necessary?

Dr. Gay: To get in the application made out in proper form and with all necessary enclosures as soon as possible.

Mr. Gowan: I want to repeat what I said at Harrisburg in reference to using a high bred mare to improve the stock. I have been breeding horses for thirty years, and I am more firmly convinced today than ever before that if you want to raise the standard of your horses, you will have to improve your mares.

Now, I should like to ask a question. The question has been agitated in our county of introducing good heavy draught stallions to use with the lighter mares to improve the stock of the country. I do not believe it will do the work. What is your opinion on that?

Dr. Gay: If the mares in your community have a preponderance of hot blood in their make-up I would not advise the use of cool blood draft horses to bring about improvement even though the mares are lacking in size and substance. Such a procedure involves a most radical cross, the results of which are extremely uncertain and unsatisfactory. A better means of securing improvement would be by the use of individuals of similar breeding but selected as possessing unusual size and substance for the breed. In France the government authorities will do nothing to encourage the breeding of light horses in the draft horse districts nor will they permit the use of cold blood in the districts which are given up to the production of light horses.

Mr. Palmer: When you get down to the second generation, you can't tell what you may get.

Dr. Gay: As soon as I become acquainted with the different districts, I will publish, within a year, a bulletin on horse breeding in the state, and then I will take up this question of breeding. I heartily agree with the gentleman, that you should not introduce new or alien blood into any well-established line of breeding that is already giving satisfactory results.

A Member: A gentleman, a few minutes ago, anticipated my question as to what constitutes soundness. Now, it seems to me that this is the weak point in the law that it does not specify this, but leaves it to the owner or the veterinarian. Of course, every man believes his horse to be the best, and it seems to me that the standard as allowed here is too uncertain. I remember very many years ago, when I used horses more than I do

now; it was my business to select a good horse, and I went to a man who was a good horseman and breeder, and I asked him what next to the temper and conformation of a horse, constituted a good horse, and he said one sound in the feet and knees, because if a horse is not good on his feet, he is practically worthless. Now, there has been but little said in regard to this important discussion, but in my judgment, it is one of the most important points in a horse. Many things have been brought out here that are true—for instance, that you can only tell the value of a horse in his get. We all know that to be true. Some of the horses I have known with the highest pedigree, are practically worthless as breeders. One of the highest pedigreed horses I ever saw was owned by Barney Treacy, of Lexington, Kentucky, yet his progeny numbered less than forty. That was clearly not a horse to have for a breeder.

Dr. Gay: The gentleman is quite right in his assertion that the foot is the foundation of the horse and the only reason that it has not been mentioned in this discussion is that there has been nothing said of any specific unsoundness I am sure that those conditions to which the horse's foot is subject would receive proper consideration in determining the qualifications of a horse for breeding purposes. The form, size and texture of the foot, however, is a matter of conformation rather than soundness.

Mr. Snyder: What would you say of grease heel?

Dr. Gay: I have never seen that listed as hereditary, because it is a temporary matter.

Mr. Snyder: We have had a good many of them, and all their offspring run that way.

Dr. Gay: Yet you would hardly be justified in calling that hereditary unsoundness. That is a point, though, on which Dr. Pearson is better qualified to speak than I am.

A Member: I believe that the national government is attempting to establish a standard for unsoundness.

Dr. Gay: Only for show ring horses, so far.

A Member: But it will take the place of an established standard, will it not?

Dr. Gay: It would, although we might not be able to apply it at the present time. It is an important move, though.

Dr. Pearson: As those of you who were at Harrisburg last year will remember, this bill was copied from the Wisconsin law, and the Wisconsin law then did not cover this question of soundness, and it is largely due to this that our law does not state specifically just what comes under the head of hereditary unsoundness. The Wisconsin law has been amended since then, and it now states what they consider unsoundness. Our act provides that the horse must be declared sound by a veterinarian, or by the owner under oath. Now, a horse could have a sprain from a perfectly legitimate cause; he may incur a sprain that will produce curby hock, but if the sprain is not caused by weakness of conformation, it would not disqualify the horse for breeding purposes. Similarly with a roarer. If a horse at nine or ten years old has pneumonia and develops roaring, he could not be considered in the same class with a horse two or three years old who has never worked.

A Member: I find a great fault in allowing the owner to make out the affidavit. There is a great deal of trickery among horsemen. I am a horseman myself, and I have never known one of them to admit that there is anything the matter with his horse. His neighbor's horse may be all wrong, but his own horse is always all right, and it appears to me that the law allows for a good deal of leeway in this matter.

Dr. Gay: There certainly must be some protection in the fact that the owner is under oath, and swears that he makes this affidavit "after diligent inquiry." I myself would highly approve of having a veterinarian examine the horse in every case, but this will have to be reached gradually.

The President: I thought the same thing, last winter in the House, but it would have been impossible to pass the bill in that form. It would have been too drastic. Now, I see no reason why the bill cannot be amended when the Legislature meets again. If it is the wish of the Association that the bill be made more drastic, it can easily be made so.

Mr. McCoy: I move you, sir, that the Chair appoint a Committee to look into this matter of unsoundness, and have them report at the next winter's meeting.

This motion was duly seconded and carried in the regular way.

The President: I will announce this committee a little later. I will see to it that it is appointed in a short time, and report to the Secretary of the organization, who will notify them.

Are there any further questions to ask Dr. Pearson or Dr. Gay?

Mr. Bayard: There is some more corn back there; if any one wants to buy it, I will be glad to sell it to him.

The President: It seems to me that some one wanted to ask a question a moment ago.

A Member: The gentleman just answered my question, but if I have a horse with a sprain, which I do not consider unsound, but the veterinarian does, how are we to get at the matter?

Dr. Pearson: On that point I would say: a horse may break his leg, and have a weak leg as the result, but if he is used for breeding purposes, his colts are required to have perfect legs. In the same way, a horse may sprain his leg and produce curby hock; in that case it is not transmissible, but if he gets that way from ordinary work, it shows that he has a weak hock, and should not be used for breeding purposes. Now, take the racing horses for instance; they are generally used on the track until they are broken down, and in the course of five or six years, these horses will generally develop imperfections that are the result of accident, and yet their get is free from these imperfections, simply they are the result of accidents, and do not belong to the horse.

The President: A motion to adjourn is in order. I would like to say to these gentlemen from the western part of the state, that I hope we will all meet at Harrisburg next year. We would like to see your faces in the East.

Mr. Bayard is still in the corn business, and if any one wishes to buy any more corn, Mr. Bayard will be glad to supply him.

Mr. McCoy: I move we adjourn.

This motion was properly seconded, and carried in the regular way, and the Ninth Annual Meeting stood adjourned.

SOME THINGS IN DAIRY FARMING

By Hon. W. D. Hoard, Fort Atkinson, Wis., Editor of Hoard's Dairyman

What does it mean to be a dairy farmer of today? This is a very important question to everyone down the long line of men who make up this great dairy industry. There is no man in that line who is as important to the industry, as the farmer back on the farm. On him must rest nearly every important consideration; the quantity of the product, the quality of it, for here he governs completely; the stability of it for if he finds it unprofitable the whole line wavers and is thrown into confusion. It is his honor, conscience, intelligence and watchful care that determines the quality of all the products of the cow. On quality depends consumption, and on consumption depends price and profit. All this depends on the man behind the cow. Then, besides, the character of the cow herself depends on his intelligence, discernment and enterprise.

The dairy farmer is the man at the switch sending the train along the right track or stalling it on a siding.

We have only to think this business of dairying out to its roots and branches to see that all the forces of education, law and public opinion should be enlisted to make the dairy farmer understand his own importance to the whole, and fully and thoroughly understand what it means to be a dairy farmer of today.

In thousands of instances the love of money, larger profit, better reward, is not enough to make thinkers of unthinking men, who keep cows and unprofitably fill the place of a profitable dairy farmer. And so there must be constant agitation of the subject: constant stirring of thought, constant holding of conventions and institutes; constant reading and study, that if possible, these men who keep cows and do not realize what dairying means, may be reached and lifted up until they can see the question in its true light.

Think of the great width of this question. Think of the vast army of men it supports from the farm to the creamery and cheese factory; of the thousands of dealers and commission merchants; of the manufacturers of machinery and dairy supplies; of the great transportation interests on both sea and land that look to it for sustenance. Then think of the millions of consumers who wait upon the cow and all these intermediaries for their daily food. The cow makes it right, pure and good. If there is any thing wrong with it, it comes from the ignorance, indifference and willful neglect of the men who stand between the cow and the consumer. Chief among these is the farmer. He must be held to the largest responsibility for he has the most to do with the milk at the time of its greatest liability to bad impressions. At every stage beyond him modern science has done more to perfect the way than it has at the farm, and this for the reason that farmers, as a class, have not believed in science. They have not taken an educated mental interest in their business. The domain of science is in the mind and farmers have had but little mind for it. Hence, they do not see how it bears upon their work. The greatest problem in agriculture today is to get the farmer to see where science touches him and his life work and so take advantage of what she has to give.

Right here lies the larger meaning of dairy farming. I have spoken thus in a general sense so we may take a larger view for a moment of the great field dairying occupies and the necessity that exists that the dairy farmer should comprehend well his own relation to it. I have selected a few special lines to talk upon that bear most sharply upon the farmer. First of these is the breeding of the right kind of a cow for his work. Do you know that when we come to study into this question, it is absolutely appalling to see what enormous losses the farmers of the country sustain because they will persist in breeding and keeping cows unfit for dairy work.

Hoard's Dairyman has spent $3,000 in taking cow censuses in ten states, from Iowa and Minnesota all the way to New England. In several of these states such as Wisconsin, Ohio and New York, several censuses have been taken. As accurate study as possible was made of each cow, in each herd, and a statement made of what she earned at the creamery and what she cost in feed.

From this mass of testimony, the best that has ever been attempted, we find that fully one-third of the cows are kept at actual loss.

Think what a drain upon the farmer and the country this is. Is it not time that the men who keep cows tried to obtain a better understanding of what it means to be a dairy farmer?

The Upward Step.

We are all affected by our environment. How universally true is the old saying "A man is known by the company he keeps." There is no getting away from the influence of association. Every farmer is subject to it. The books and papers he reads are his associates, just as much as the men he meets. One of the greatest dairymen Wisconsin ever produced was Hiram Smith, of Sheboygan county, who died in 1890 and for whom one of the important buildings on the University Campus, the Hiram Smith Hall, was named. One of his favorite sayings was, "A registered sire is a great educator. It is an upward step." He had seen farmers about him in all stages of development and with no development and he declared that there was no hope of a man's upward progress as a farmer just as long as he kept a grade or scrub sire. Here again do we see the effect of the law of association. We have noted it ourself in hundreds of instances. All about us in Jefferson county, Wisconsin, now noted for its production of dairy cattle, are farmers who have made handsome progress in knowledge and wealth. Their progress dates from the very hour that they commenced keeping a pure-bred sire. A large proportion of them are Germans, who have been obliged to learn to read English in a slow and difficult manner. They saw the improvement that came in their neighbor's cattle from such a sire. That set them to thinking. Buyers came and paid more for the heifers and cows from such sires. The buyers were a different order of men. They talked on an upward grade. Here was another association. One good sire at registered prices succeeded another. That was more association. Their minds began to expand: they could see

more in this business of dairy farming. Their farms are selling for $100 to $150 an acre. They sell annually a half million dollars' worth of cattle. Their sons are going ahead, making more intelligent dairy farmers than did the fathers. They are attending the short course at the College of Agriculture. Several of them have branched out into breeding registered cattle. In 20 years there will be hundreds of such breeders in Jefferson county. Who can measure the influence and effect upon a farmer when he commences to associate with pure-bred cattle?

Yes, Hiram Smith was right, "A registered sire is a great educator." Verily, "A man is known by the company he keeps." Scrub cattle will hold a man down to scrub ideas on general farming. There can be no "upward step." The influence is retroactive on both the farmer and his cattle. Better ideas lie at the bottom of all betterment.

There are a hundred copies of dairy and agricultural papers read by our Jefferson county farmers today where there was one 20 years ago. The barns, the fences, the fields of alfalfa, clover and corn, all show an upward trend in thought as well as in the methods they practice. How powerful has been the reflex effect of this law of association. Let us be careful of the company we keep. "Birds of a feather flock together." When a man buys a registered sire he gives notice to the world that he is on an up grade himself in his ideas of cattle. It will not be long before he will think towards improvement in other things.

Keep the Calves Dry and Clean.

Every human mother, that is fit to be a mother, knows that if her baby is allowed to remain wet and uncleanly, it will soon grow sickly. The bovine baby is strictly amenable to the same law. Every calf raiser must have seen the ill effects of allowing calves to lie in their own voidings and urine. A farmer was once showing us his stock. His horses were bedded down with an abunddance of straw. His calves were lying in filth and moisture that made us indignant to behold. "What are you raising those calves for?" we asked. "To make cows of them," he replied. "Oh, no, you are not. You are raising them to be weak sickly failures," was our answer. He confessed to us that he had lost a good many calves, but he never had thought that the way he kept them was the cause.

Turn a calf or a pig out in the woods and it will find for itself a bed of dry leaves in a clean place, and they will keep healthy, if they have food enough.

In my own calf stable every winter are from 25 to 30 calves. Around the outside, next to the wall, is a feeding alley. Then comes a row of stanchions, the only place on the premises where I use a stanchion. Then comes the open ample room with a dirt floor. This is covered every day, and if necessary, twice a day, either with bright dry straw or shavings. This floor is sprinkled night and morning with a good disinfectant. The calves are fed in these stanchions, with skim milk, fresh from the separator, in clean tin pails twice a day. Then they are given a feed of oats or barley meal, followed by alfalfa hay. All this consumes an hour, say. Then they are let out of the stanchions to run at will on the floor. Twice a day they are let out in the big barn yard to have a run and play. Fresh water is kept standing before them, on the floor of the stable, all the time.

Now this care takes a little time and thought. But you can never have skill and good judgment, nor the rewards of skill and judgment, unless you invest time and thought. All this care has a great effect on the future cow. I have raised but one heifer, pure bred or grade, to cowhood in 15 years, that would not produce 300 pounds of butter and over a year. It is this careful developing, care and feed, I believe, aided by good breeding, that has given me these results.

Don't you think I have made a good deal more money with my cows by this method, than I would if I had pursued the common neglectful way? Farmers have not yet begun to half think on the fine possibilities there are in the production of valuable cows. The demand for dairy products, all over the Union, is far ahead of the supply. And the cleaner, sweeter, more perfect we make that product the more does the demand increase.

Think of the demand there is, today, for good cows. A few weeks ago Mr. F. B. Fargo, of Lake Mills, Wis., placed a five-line ad. in Hoard's Dairyman, offering to furnish Holstein grade cows by the car-load. In two weeks' time he had received hundreds of letters, as far distant as Texas, Mexico, California, Oregon and the states on the Atlantic coast, the writers of which were all anxious for one or more car-loads. He was amazed at the demand. It is so in other dairy breeds. Don't you think it will pay to turn your attention to the question of producing superior cows for your own use and the market?

The present methods of handling cows, in the great milk producing centers amount to the destruction almost of all calf raising. Cows are bought, fed high for a year or so, and sold to the butcher. This makes all the better the chance for the intelligent, far sighted, dairy farmer to make a handsome profit in growing cows to supply that market.

A Good Bull.

There is a great host of dairy farmers who cannot yet see the cash advantage of buying a pure-bred bull and paying the going price for him. The price blinds their eyes, and so they go around looking for a cheap bull, not one that can bring them something good in return. They will say, "Oh, I'm not breeding registered stock. I cannot afford to pay the regular price for a bull." That is short sighted economy as sure as they live. They are keeping down the quality of their own cows in the future and the value of the young heifers they may want to sell. An Illinois man who annually buys over a hundred thousand dollars' worth of cows and heifers in Jefferson county, Wis., said to me recently. "I buy a cow on her looks, but I never buy a heifer until I take a look at her sire. If he is a good one, I am more confident of the value of the heifer."

Now, here is a practical example drawn from my own experience: In February, 1902, the Guernsey bull, Starlight's Excelsior 7992, was born. He was bred by the late N. P. Fairbanks, of Lake Geneva, Wis. I bought him when little more than a calf, paying a price up in the hundreds for him. I was attracted to him by the rich character of his pedigree, the excellent record of the cows

back of him and his strong prepotent appearance. He will be five years old February next, and is in his prime. From that bull I have sold $810 worth of grade Guernsey heifer calves, $1,500 worth of registered heifer calves, $2,000 worth of registered bull calves, making a total of cash sales of calves, from him of $4,310. I have on hand six of his heifers in milk two years old that I can sell any day for $1,500, and 18 of his calves with nine more to come that are worth at a low estimate $2,500. This makes the total value of his stock up to date, $8,310. Cut it in two, giving one-half of the value to the cows and then the bull stands credited with $4,155. Could I afford to pay a good price for him?

When I was a boy I read in an old almanac this verse:

"A fiddler had a cow and he had nothing for
to feed her,
So he took his fiddle and played the tune
'Consider, cow! consider.'"

Allow me for a few minutes to ring the changes on the word "consider." Please consider that the grade heifer calves of this bull, such as any farmer can raise if he will but have rich blood in the bull to start with, brought me $810, double what he cost me. It is hard to make dairy farmers see that they want good well-bred stock themselves; next, that there are thousands of other farmers that want it more than they do and are willing to pay for it. Consider, that there is no one form of our live stock today that is so scarce as good cows: that in the natural evolution of public conviction, cows will be scarcer owing to weeding out of unfit cows and consequent reduction of the size of the herds; that the consumption of milk as a food is increasing to an enormous extent and as a consequence is stiffening the prices of butter and cheese. In most of the butter and cheese producing districts there is a noticeable lessening of production owing to the drainage of cows away to other sections for city milk production.

Consider, that in all these city milk producing districts there are but very few calves raised, while the cows are kept rarely more than three years.

Consider, that only one-half of all the calves are heifers and of these but a small percentage reach cowhood, that consequently the increase of cows in so great a dairy state as Wisconsin has been only 5½ per cent yearly from 1850 to 1900. Consider, that every child born is a consumer of milk but not always of meat.

Consider, the enormous increase in the population of this country, vastly ahead of the increase in the cow population. Consider, all these things as having a bearing on the future of the dairy industry and then tell me if you do not think there is a good prospect ahead for the farmer who will go into the business of producing and rearing first class dairy cows, bred from sires of undoubted dairy parentage.

I have a neighbor, a bright keen German dairy farmer. He buys, every four or five years, the best registered Guernsey bull calf he can find to replace his old bull in a year or so. He pays handsome prices for his bulls and he will not buy a cheap animal. Mind you his herd is nearly all grade cows. He is a fine calf raiser and sells annually from 8 to 10 prime young heifers and yearlings for from $25 to $40 each, and he has quick sale for all he can produce. He will tell you every time that the great factor of success with him is the high quality of the bull he keeps. Don't you think his advanced ideas pay him better than as though they were of the ordinary unthrifty unprogressive order? He lives on a rented farm of 171 acres and he gives cash receipts of the farm in butter, cream, hogs, poultry, young cattle, etc., to the amount of $4,000 annually and he has half of it. Don't you think it pays him to practice advanced ideas of farming?

The Matter of Breed.

It is a common thing to hear men say: "Pay no attention to the matter of breed in cows. What you want is a cow that will do business at the pail." That sort of talk is very superficial. The question of breed is a very important one. The farmers of Minnesota followed Prof. Shaw for years and as he told them, selected beef bred bulls to breed "dual purpose" cows for dairy work.

They found at last, to their sorrow, that they were getting the losing end of the bargain. Their cows were failures as dairy animals. Hoard's Dairyman warned them against the practice and anybody who had an understanding of the effects of breed on feed, could have told them the same. For years the farmers of Iowa have been advised the same thing. All the forces of agricultural education were put in requisition to hold them to the "dual purpose" idea. But the cows resulting from such breeding are not, as a rule, economic dairy animals.

The Iowa farmers, those of them who are looking into the thing, are finding that with such cows, they are losing more at the pail than they are making in beef. And so they are getting around. Hoard's Dairyman has for years preached this doctrine: If you want milk you must breed for it, and breed for it specifically.

Mistakes in breeding are a long time in making themselves felt. Hence the importtance to every farmer that he should have correct ideas as to the principles of breeding. No wonder that he is confused when well-known teachers and breeders juggle with these principles. It is as though one said, "Twice two is either three or five just as you want it." Yes, there is a great deal in breed. We once heard a story of a "dual purpose" man who went to hire out as a teacher of a country district school. The clerk asked him a few questions among which was this: "Is the earth round or flat?" "Well," said the man, "teach 'em both ways, just as they want."

A great many farmers have wanted "dual purpose" cows if they could get them. They called for that kind of teaching and they got it. But it was wrong, and they are finding it out in the last analysis of real practical results, at the pail. The farmers who stand by the dairy bred cow are winning by it. Yes, there is a good deal in breed.

I spoke of the effect of breed on feed. Here is a great mystery that no man has solved. Here stands a bale of hay. On one side is a cow; on the other is a sheep. on the other a horse. In one case the result is milk, in the other wool, in the other speed or draft, and the same mystery appears in the family of animals. Twelve quarts of oats fed to J. I. C. resulted in a mile in 2:10. That was the speed product of 12 quarts of oats, provided they were

fed to J. I. C. Two cows stand side by side in my barn. They are of the same breed, and both are fed the same ration. One cow takes that food and turns out two pounds of butter fat a day, the other one pound. What is that secret through which comes such a wide disparity of results? So far as we can see, it is individuality.

Now men have seized upon these individual traits in animals. They are functional in character. By steadfast, patient work, mating agreeing individualities or functions together, after a long time they have established these traits as breed characteristics and we have the speed or draft function in horses, the milk and butter trait, or the meat producing trait in cattle, the fine wool or mutton function in sheep, and so on. A great variety of ruling traits have been established. But it is very slow work. Nature yields but reluctantly to any and all modifications of structure and specific purpose.

The modern dairy cow, as has been well said, is an artificial product. She is greatly needed in the sharp, close economy of our farming work because of the greatly increasing demand for her product. This modern dairy cow is not a rustler. She must be given the care, surroundings or environment, and feed suitable to her artificial nature, if you expect the results she is capable of giving.

Then comes this everlasting proposition of farm economics, reducing the cost of production. When I turn to those two cows, one giving me twice the product for the same cost of food that the other does, I naturally enquire how this comes. Now when I find that the first cow comes down from a better line of producing ancestors than the other, it is apt to impress me with the idea that there is something in breeding, not everything, but something.

Now, all there is to this question of breeding for specific qualities or traits, is the attempt to establish as a breed characteristic, that which originally existed as an individual characteristic. So after a long time, we have the Holstein cow with her peculiar traits, bred into her for a thousand years; the Ayrshire with hers, the Jersey and the Guernsey with theirs. If you study her you will find that Nature does her best work in straight lines, and in obedience to single purposes. If you attempt to make her construct a combined speed and draft horse, or a combined milk and beef cow, she tells you at once that the structural type or form of each is different, owing to the demand of differing functions, the same as the difference in form of the sewing machine and the mowing machine.

She tells you also that established prepotencies of heredity, one opposing the other, cannot be mated and combined to the establishment of a third prepotency partaking of the nature of both.

She tells you further, that such a forced combination results in a conflict of prepotencies and no wise breeder will set Nature to fighting herself. Our "dual purpose" friends have made one serious mistake. They have based their theory too much on the sporadic or occasional appearance of some most excellent cow here and there in their ranks. They have gone on building the beefiest bulls they could produce, paying no attention to the laws of dairy form and function, and expecting profitable milk results from such a contradictory combination.

I have asked for years this question: Where are the Shorthorn bulls, for instance, that show in their form and outline, a milk heredity, or that can be depended on to breed with any profitable certainty for milk production? This ignoring almost altogether the male line of descent, all the time breeding from the beefiest of beef heredity, and then talking about "a milking strain" is unscientific, impracticable, and as the old Yankee said, "insensible."

WHAT WE BREED

PURE BRED STOCK BRED BY MEMBERS OF THE PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

HORSES.

ARABS.

Name. Postoffice. County.
Herman Hoopes.....Westchester, Chester

MORGANS.

Geo. A. Hogg.....24th & R. R. Sts., Pittsburg
M. B. Stephens.....Dilltown, Indiana

CLEVELAND BAY.

Powell Bros.....Shadeland, Crawford

FRENCH COACH.

Powell Bros.....Shadeland, Crawford

CLYDESDALE.

Powell Bros.....Shadeland, Crawford

FRENCH DRAFT.

Powell Bros.....Shadeland, Crawford

SUFFOLK PUNCH.

Powell Bros.....Shadeland, Crawford

BELGIAN.

Powell Bros.....Shadeland, Crawford
Lyman Hunter.....Hartstown, Crawford

STANDARD-BRED.

Peter B. Cowan.....Brookville, Jeff.
Benj. McKeehan.....Mt. Rock, Cumberland
W. C. Norton.....Waymart, Wayne
Homer Bros.....Greenville, Mercer
Jas. Blair (Carriage type).Hartstown, Crawf'd
Henry Palmer.....Avondale, Chester
Powell Bros.....Shadeland, Crawford
W. E. Stevenson..Burgettstown, Washington
J. M. Main & Sons.Shippensburg, Cumberl'd
D. H. Waite....Warrior's Mark, Huntingdon
W. H. Ridge.....Trevose, Bucks

SHIRE.

Sam'l McCreary.....Volant, Lawrence
Wm. L. Christley.....Slippery Rock, Butler
Geo. A. Hogg....24th & R. R. Sts., Pittsburg
Powell Bros.....Shadeland, Crawford

PERCHERONS.

J. H. Kidd.....Mars, Butler
D. S. Kloss.....Tyrone, Blair
A. M. Dickson & Son..Cochranton, Crawford
E. B. Boyle.....Canonsburg, Washington
J. M. Main & Sons..Shippensburg, Cumberl'd
Geo. A. Hogg....24th & R. R. Sts., Pittsburg
W. A. McCoy & Sons.....Mercer, Mercer
Powell Bros.....Shadeland, Crawford
Lyman Hunter.....Hartstown, Crawford
Wm. F. Gable.....Wyebrook, Chester
John W. Burket.....Tyrone, Blair
W M. Lyon & Son.....Wyalusing, Bradford

THOROUGHBREDS.

R. S. Hartley.....Youngsville, Warren

HACKNEYS.

Geo. A. Hogg....24th & R. R. Sts., Pittsburg
Powell Bros.....Shadeland, Crawford
Lyman Hunter.....Hartstown, Crawford

SHETLAND PONIES.

Wm. F. Gable.....Wyebrook, Chester
W. M. Thompson.....Uniontown, Fayette
F. B. Stewart.....Espyville, Crawford
Powell Bros.....Shadeland, Crawford

CATTLE.

ABERDEEN-ANGUS.

C. L. Taggart.....Washington, Washington
W. H. Rink.....Johnstown, Cambria
W. L. Christley.....Slippery Rock, Butler
Jas. Blair.....Hartstown, Crawford
Bayard Bros.....Waynesburg, Greene
Penn'a State College....State College, Center
Geo. Black.....Dayton, Armstrong
Lyman Hunter.....Hartstown, Crawford

AYRSHIRES.

W. W. Blake Arkcoll.....Paoli, Chester
E. L. & Sidney Roberts.....Malvern, Chester
Willis W. Hopkins.....Aldenville, Wayne

BROWN SWISS.

R. I. Young.....Middletown, Dauphin
W. H. H. Riddle.....Butler, Butler

DEVONS.

B. F. Jones.....South Montrose, Susq.
A. S. Worden.....Frederick, Md.
J. Cheston Morris.....Westchester, Chester
Powell Bros.....Shadeland, Crawford

POLLED ALBIONS.

B. E. Ferris.....Hector, Potter

HOLSTEINS.

Herman Straub.....Pittsburg, Allegheny
T. J. Erdley.....Lewisburg, Union
W. T. Suter.....Riverside, Northumberland
Sam'l McCreary.....Volant, Lawrence
H. M. Lyon & Sons....Wyalusing, Bradford
J. B. Henderson..Burgettstown, Washington
B. F. Jones.....South Montrose, Susq.
A. S. Worden.....Frederick, Md.
Geo. G. Paxton.....Houston, Washington
W. E. Stevenson..Burgettstown, Washington
D. S. Kloss.....Tyrone, Blair
J. M. Quivey & Sons...Houston, Washington
J. M. Paxton.....Houston, Washington
Powell Bros.....Shadeland, Crawford
D. E. Notestine.....Lewistown, Mifflin
Nelson Poorbaugh.Mt. Pleasant, Westmorel'd

POLLED DURHAMS.

D. C. Andrews.....West Newton, Westm'd
Lee R. Scott.....Burgettstown, Washington
Chas. Buchanan.....Utica, Venango
J. C. Mattern & Sons....Holidaysburg, Blair

RED POLLS.

M. G. King.....Mt. Wolf, York
B. E. Ferris.....Hector, Potter
N. O. Brownlee.....Crothers, Washington
A. M. Dickson & Son..Cochranton, Crawford
D. Norman App.....Selinsgrove, Snyder
John F. Zook.....Belleville, Mifflin
Sidney T. Isett....Spruce Creek, Huntingdon

SHORTHORNS.

W. J. Sturgeon.....Kittanning, Armstrong
C. A. Hershey.....Gettysburg, Adams
W. M. Thompson.....Uniontown, Fayette
F. N. Hubbard.....Troy, Bradford
John A. Cummins.....Waynesburg, Greene
Geo. G. Strosnider.....Waynesburg, Greene
G. D. Walker.....Salona, Clinton
J. L. Stauffer.....Southwest, Westmoreland
A. S. Eagleson & Sons....Washington, Wash.
Jos. T. Fleming.....Belleville, Mifflin
W. J. Monroe.....Greensburg, Westmoreland
W. C. Black.....Mercer, Mercer
B. L. Post's Sons....West Alexander, Wash.
L. Douthett.....Thornhill, Allegheny
W. A. McCoy & Sons.....Mercer, Mercer
Lee R. Scott.....Burgettstown, Washington
Penn'a State College....State College, Center
A. G. Shaffer.....Rural Valley, Armstrong
L. D. May.....Granville Center, Bradford
R. C. Vance.....Burgettstown, Washington
R. L. Munce.....Canonsburg, Washington
D. H. Waite....Warrior's Mark, Huntingdon
E. B. Boyle.....Canonsburg, Washington

GUERNSEYS.

W. H. Ridge.....Trevose, Bucks
R. S. Nicholson & Sons....Kittanning, Arm'g
B. F. Gabler & Son.....Greensboro, Greene
T. M. McKee.....Lewistown, Mifflin
Penn'a State College....State College, Center
J. E. Woodmansee.....Lake Como, Wayne
Nelson Poorbaugh....Mt. Pleasant, Westm'd.
Wm. F. Gable.....Wyebrook, Chester
R. S. Hartley.....Youngsville, Warren
Irwin F. McKee....Washington, Washington
H. H. Snavely.....Willow Street, Lancaster
Wm. Thompson, Jr.....Lemont, Center
Geo. G. Paxton.....Houston, Washington
J. H. Peachy.....Belleville, Mifflin
H. C. Bughman...Greensburg, Westmoreland
R. F. Shannon.....907 Liberty St., Pittsburg
Henry Palmer.....Avondale, Chester
H. W. Comfort.....Fallsington, Bucks
R. S. Love.....Mt. Pleasant, Westmoreland
Shook Bros.....Spring Mills, Center

JERSEYS.

R. S. Love.....Mt. Pleasant, Westmoreland
R. S. Nicholson & Sons..Kittanning, Arm'g
Jno. W. Bronson.....New Galilee, Beaver
Jas. I. Thompson.....Lemont, Center
Chas. A. Porter.....Torresdale, Philadelphia
Ludwig S. Filbert....Fox Chase, Philadelphia
Geo. S. Barnhart..Greensburg, Westmoreland
R. I. Young.....Middletown, Dauphin
Geo. Erk.....Seelyville, Wayne
B. W. McKeehan.....Mt. Rock, Cumberland
A. L. Martin.....Harrisburg, Dauphin
Edward Walter.....West Chester, Chester
A. P. Warren.....Elizabeth, Allegheny
Jas. H. Cowan.....Duquesne, Allegheny
J. M. Main & Sons..Shippensburg, Cumberl'd
John B. Kepple...Greensburg, Westmoreland
W. F. Shrum.....Adamsburg, Westmoreland
M. P. Shoemaker & Bro..Greensburg, West.
G. H. Knapp.....Aldenville, Wayne
L. W. Lighty.....East Berlin, Adams
R. S. Hartley.....Youngsville, Warren
J. I. Barley.....Baker's Summit, Bedford
W. E. & J. J. Perham.....Niagara, Wayne
W. C. Norton.....Waymart, Wayne
S. E. Nivin.....Landenburg, Chester
A. T. Replogle.....Waterside, Bedford
Austin Leonard & Son.....Troy, Bradford
W. F. Wagner..Harrison City, Westmorel'd
Clarence M. Glasgow....Calvin, Huntingdon
Herman Hoopes.....Westchester, Chester
W. W. Harrison..119 N. 11th St., Philadelphia
R. F. Shannon.....907 Liberty St., Pittsburg
Henry H. Randt.....Pipersville, Bucks
J. B. Wylie.....Washington, Washington
W. F. McSparran.....Furniss, Lancaster
E. B. Boyle.....Canonsburg, Washington
J. H. Silvis.....Greensburg, Westmoreland
M. E. Reeder.....Muncy, Lycoming
T. M. Shively.....Mifflinburg, Union
T. A. Schierer.....Slatington, Lehigh

SWINE.

BERKSHIRES.

Jno. W. Bronson.....New Galilee, Beaver
T. J. Erdley.....Lewisburg, Union
W. T. Kennedy.....Mars, Butler
J. H. Silvis.....Greensburg, West'ld
A. L. Martin.....Enon Valley, Lawrence
J. N. Glover.....Vicksburg, Union
A. S. Worden.....Frederick, Md.
R. W. Crothers & Son....Taylorstown, Wash.
Edward Walter.....Westchester, Chester
J. M. Main & Sons..Shippensburg, Cumberl'd
Nelson Poorbaugh....Mt. Pleasant, Westm'd
Sam'l McCreary.....Volant, Lawrence
Jas. L. Henderson..Washington, Washington
L. W. Lighty.....East Berlin, Adams
A. H. Erdman.....Wiconisco, Dauphin
J. B. Henderson..Burgettstown, Washington
G. D. Walker.....Salona, Clinton
Ralph Minner & Sons.....Mercer, Mercer
J. Cheston Morris.....Westchester, Chester
T. M. Shively.....Mifflinburg, Union
W. C. Black.....Mercer, Mercer
Homer Bros.....Greenville, Mercer
H. C. Bughman..Greensburg, Westmoreland
R. F. Shannon.....Pittsburg, Allegheny
A. S. Eagleson & Sons....Washington, Wash.
N. O. Brownlee.....Crothers, Washington
S. V. McDowell & Son.....Fredonia, Mercer
W. F. McSparran.....Furniss, Lancaster
J. M. Paxton.....Houston, Washington
W. F. Holtzer....Greensburg, Westmoreland
W. H. Gray.....Brookville, Jefferson
D. H. Waite....Warrior's Mark, Huntingdon
T. J. Erdley.....Lewisburg, Union

DUROC-JERSEYS.

Wm. Thompson, Jr.....Lemont, Center
B. L. Post's Sons....West Alexander, Wash.
George Black.....Dayton, Armstrong
S. S. Blyholder.....Neale, Armstrong
D. E. Notestine.....Lewistown, Mifflin
Sidney T. Isett....Spruce Creek, Huntingdon
G. I. Fugate.....Ellsworth, Wash.
R. S. Nicholson Sons....Kittanning, Arms'g

CHESTER WHITES.

Peter B. Cowan.....Brookville, Jefferson
Herman Straub.....Pittsburg, Allegheny
G. S. Barnhart....Greensburg, Westmoreland
H. M. Lyon & Sons....Wyalusing, Bradford
J. C. Mattern & Sons....Hollidaysburg, Blair
R. L. Munce.....Canonsburg, Washington
Edward Walter.....Westchester, Chester
A. P. Warren.....Elizabeth, Allegheny
J. E. Woodmansee.....Lake Como, Wayne
Benj. McKeehan.....Mt. Rock, Cumberland
W. F. Gable.....Wyebrooke, Chester
H. M. Lyon & Sons.....Wyalusing, Bradford
Willis W. Hopkins.....Aldenville, Wayne
F. W. Levis.....Chadd's Ford, Chester
A. T. Replogle.....Waterside, Bedford

Jos. T. Fleming.....Belleville, Mifflin
W. J. Monroe.....Greensburg, Westmoreland
D. S. Kloss.....Tyrone, Blair
Sidney T. Isett....Spruce Creek, Huntingdon
W. A. McCoy & Sons.....Mercer, Mercer
A. M. Dickson & Son (O I C)
Cochranton, Crawford
S. V. McDowell & Son.....Fredonia, Mercer
D. W. Jones.....Wilmore, Cambria
J. H. Silvis.....Greensburg, Westmoreland
J. N. Glover.....Vicksburg, Union
E. B. Boyle.....Canonsburg, Washington
T. M. McKee.....Lewistown, Mifflin
R. C. Vance.....Burgettstown, Washington

OZARK OR MULE FOOT HOGS.

A. M. Dickson & Son..Cochranton, Crawford

POLAND-CHINAS.

G. I. Fugate.....Ellsworth, Washington
W. J. Sturgeon.....Kittanning, Armstrong
W. M. Thompson.....Uniontown, Fayette
J. C. Mattern & Sons....Hollidaysburg, Blair
D. Norman App.....Selinsgrove, Snyder
A. G. Shaffer.....Rural Valley, Armstrong
A. P. Warren.....Elizabeth, Allegheny
Edward Walter.....Westchester, Chester
C. A. Hershey.....Gettysburg, Adams
W. F. Wagner..Harrison City, Westmoreland
J. L. Stouffer.....Southwest, Westmoreland
Burns & Adams.....Imperial, Allegheny
J. H. Peachey.....Belleville, Mifflin
T. M. McKee.....Lewistown, Mifflin
R. S. Love.....Mt. Pleasant, Westmoreland
T. M. Shively.....Mifflinburg, Union

CHESHIRES.

B. F. Gabler & Sons.....Greensboro, Greene

IMPROVED YORKSHIRE.

H. C. Bughman.....Greensburg, West'ld

TAMWORTHS.

R. S. Hartley.....Youngsville, Warren

SHEEP.

BLACKTOP MERINOS.

John M. Berry.....Wylandville, Washington
R. P. Berry.....Eighty-four, Washington
R. L. Munce.....Canonsburg, Washington
E. B. Boyle.....Canonsburg, Washington

DELAINE MERINOS.

Geo. G. Paxton.....Houston, Washington
Lee R. Scott.....Burgettstown, Washington
E. B. Boyle.....Canonsburg, Washington
B. L. Post's Sons....West Alexander, Wash.
R. W. Crothers & Son....Taylorstown, Wash.
A. L. Martin.....Enon Valley, Lawrence

CHEVIOT.

S. V. McDowell & Son.....Fredonia, Mercer

SOUTHDOWNS.

Ludwig S. Filbert....Fox Chase, Philadelphia
Edward Walter.....Westchester, Chester
W. A. McCoy & Sons.....Mercer, Mercer
R. C. Vance.....Burgettstown, Washington

DORSETS.

T. M. McKee.....Lewistown, Mifflin
A. S. Eagleson.....Washington, Washington
J. B. Henderson..Burgettstown, Washington
S. Shaffer.....New Castle, Lawrence
J. B. Wylie.....Washington, Washington
Henry Palmer.....Avondale, Chester
A. M. Dickson & Son..Cochranton, Crawford

LINCOLNS.

R. S. Nicholson & Sons.....Kittanning, Arm'g
Benj. McKeehan.....Mt. Rock, Cumberland
T. M. Shively.....Mifflinburg, Union
W. A. McCoy & Sons.....Mercer, Mercer

COTSWOLDS.

S. V. McDowell & Son.....Fredonia, Mercer
R. S. Love.....Mt. Pleasant, Westmoreland

HAMPSHIRES.

W. J. Monroe.....Greensburg, Westmoreland
Jas. Blair.....Hartstown, Crawford
Edward Walter.....Westchester, Chester
A. M. Dickson & Son..Cochranton, Crawford

LEICESTERS.

W. A. McCoy & Sons.....Mercer, Mercer

OXFORDS.

A. M. Dickson & Son.....Cochranton, Mercer
A. G. Shaffer.....Rural Valley, Armstrong
A. S. Worden.....Frederick, Md.

SPANISH MERINOS.

Jas. Lindsay & Sons.....Utica, Venango
Lee R. Scott.....Burgettstown, Washington

SHROPSHIRES.

A. L. Martin.....Enon Valley, Lawrence
J. C. Mattern & Sons....Hollidaysburg, Blair
J. F. Lantz & Co.....Wyebrooke, Chester
Edward Walter.....Westchester, Chester
Wm. F. Gable.....Wyebrooke, Chester
C. A. Hershey.....Gettysburg, Adams
S. Shaffer.....New Castle, Lawrence
A. T. Replogle.....Waterside, Bedford
Jos. T. Fleming.....Belleville, Mifflin
Clarence M. Glasgow.....Calvin, Huntingdon
W. C. Black.....Mercer, Mercer
B. L. Post's Sons....West Alexander, Wash.
Sidney T. Isett.....Spruce Creek, Huntingdon
Herman Hoopes.....Westchester, Chester
D. S. Kloss.....Tyrone, Blair
J. C. Andrews.....Mattie, Bedford
Wm. Thompson.....Lemont, Center
John W. Burket.....Tyrone, Blair
D. W. Jones.....Wilmore, Cambria

SUFFOLK.

A. M. Dickson & Son.....Cochranton, Mercer

BLACKFACED HIGHLAND.

A. M. Dickson & Son....Cochranton, Mercer

ANGORA GOATS.

R. S. Love.....Mt. Pleasant, Westmoreland
A. M. Dickson & Son..Cochranton, Crawford

POULTRY.

PLYMOUTH ROCKS.

W. F. McSparran.....Furniss, Lancaster
W. C. Norton.....Aldenville, Wayne
Edwin Johnson.....Taylorsville, Bucks
Jno. W. Bronson.....New Galilee, Beaver
Herman Straub.....Pittsburg, Allegheny
W. T. Kennedy.....Mars, Butler
W. J. Monroe.....Greensburg, Westmoreland
W. T. Suter (W)..Riverside, Northumberland
J. A. Herr (B).....Mill Hall, Clinton
M. N. Clark (B).....Claridge, Westmoreland
Edward Walter.....Westchester, Chester
J. F. Lantz & Co.....Wyebrooke, Chester
Penn'a State College....State College, Center
A. P. Warren (B&Buff).Elizabeth, Allegheny
T. M. McKee (B).....Lewistown, Mifflin
D. N. App (B & W).....Selinsgrove, Snyder
Jas. H. Cowan.....Duquesne, Allegheny
Nelson Poorbaugh (Wh)..Mt. Pleasant, West.
C. A. Hershey (B).....Gettysburg, Adams

M. P. Shoemaker & Bro. (W).Greensbg, West.
W. H. Gray (B).....Brookville, Bradford
H. M. Lyon & Sons (B)..Wyalusing, Bradford
D. W. Jones.....Wilmore, Cambria
Geo. S. Barnhart..Greensburg, Westmoreland
Wm. Thompson.....Lemont, Center
Sidney T. Isett....Spruce Creek, Huntingdon
J. I. Barley.....Baker's Summit, Bedford
John A. Cummins (B)...Waynesburg, Greene
G. D. Walker.....Salona, Clinton
A. T. Replogle.....Waterside, Bedford
Dr. J. Stewart Lacock (Wh)..Pittsburg, Ally.
W. F. Wagner (B)...Harrison City, Westm'd
J. L. Stouffer (B)...Southwest, Westmoreland
Jos. T. Fleming (Wh).....Belleville, Mifflin
Burns & Adams.....Imperial, Allegheny
Wm. Thompson, Jr. (B).....Lemont, Center
J. H. Peachey (B).....Belleville, Mifflin
J. Wolf Evans (Bf).....Spring Mills, Center
Herman Hoopes (B).....Westchester, Chester
A. S. Eagleson & Sons (B).Washington, Wash.
N. O. Brownlee (B).....Crothers, Washington
S. V. McDowell & Sons (B)..Fredonia, Mercer
Henry Palmer (Bf).....Avondale, Chester
J. C. Andrews (B).....Mattie, Bedford
W. A. McCoy & Sons (Wh)...Mercer, Mercer
Nelson Bros. (B).....Grove City, Mercer
Penn'a State College (B).State College, Center
R. S. Love (W)..Mt. Pleasant, Westmoreland
J. M. Paxton (Bf).....Houston, Washington
J. H. Silvis.....Greensburg, Westmoreland
D. H. Waite.....Warrior's Mark, Huntingdon
D. E. Notestine.....Lewistown, Mifflin
Shook Bros.....Spring Mills, Center

COCHINS.

J. N. Glover (B).....Vicksburg, Union
Pa. State College.....State College, Center
John M. Berry (Wh)..Wylandville, Wash'gt'n

RHODE ISLAND REDS.

R. F. Shannon..Edgeworth Station, Allegheny
W. H. Knarr.....Greensburg, Westmoreland
Pa. State College.....State College, Center
D. Norman App.....Selinsgrove, Snyder

ORPINGTONS.

R. F.Shannon.....Pittsburg, Allegheny
J. N. Glover.....Vicksburg, Union

BLACK POLISH.

Pa. State College (WC)..State College, Center

WYANDOTTES.

S. Shaffer.....New Castle, Lawrence
R. S. Nicholson & Sons....Kittanning, Arm'g
Herman Straub (Wh)....Pittsburg, Allegheny
Jas. I. Thompson (W).....Lemont, Center
Pa. State College.....State College, Center
Julius LeMoyne (Wh).....Washington, Wash.
F. E. Traver (Buff.....Wyebrooke, Chester
R.W.Crothers & Son (W).Taylorstown, Wash.
A. G. Shaffer (Sil)...Rural Valley, Armstrong
Wm. F. Gable (Bf).....Wyebrooke, Chester
C. A. Hershey (Wh).....Gettysburg, Adams
L. W. Lighty (Wh).....East Berlin, Adams
D. W. Jones.....Wilmore, Cambria
B. F. Jones (Wh).....South Montrose, Susq.
Dr. J. Stewart Lacock (Wh)...Pittsburg Ally.
W. F. Holtzer (Bf)..Greensburg, Westmorel'd
B. L. Post's Sons (Wh)..W. Alexander, Wash.
Homer Bros. (Bf).....Greenville, Mercer
H. C. Bughman (SL)....Greensburg, Westm'd
H. H. Snaveley.....Willow Street, Lanc.
D. S. Kloss (Wh).....Tyrone, Blair
Ezra Michener.....Michener, Bucks
R. S. Love (W).....Mt. Pleasant. Westmorel'd

MINORCAS.

Wm. F. Gable.....Wyebrooke, Chester
R. S. Hartley.....Youngsville, Warren
Pa. State College (Blk)..State College, Center
R. F. Shannon (Bl).....Edgeworth Sta., Ally.

BRAHMAS

Edward Walter.....Westchester, Chester
B. E. Ferris (Lt).....Hector, Potter
Clarence M. Glasgow (Lt)..Calvin, Hunt'don
Pa. State College (Lt)...State College, Center

LEGHORNS.

R. F. Shannon.....Edgeworth Sta., Ally.
Jas. Lindsey & Son (R C B)..Utica, Venango
W. T. Suter (R C W)...Riverside, Northum'ld
G. S. Barnhart (Bf)....Greensburg, Westm'd
J. Wolf Evans (Scw W & B), Spng Mills, Cen.
R. L. Munce (S C B).....Canonsburg, Wash.
J. E. Woodmansee (Scw)..Lake Como, Wayne
A. P. Warren (Bf).....Elizabeth, Allegheny
Nelson Poorbaugh (Wh), Mt. Pleasant, West'd
M. P. Shoemaker & Bro. (Br), Gr'nsb'g,West.
W. H. Gray (Wh).....Brookville, Jefferson
L. W. Lighty (Wh).....East Berlin, Adams
Willis W. Hopkins (Br).....Aldenville, Wayne
R. S. Hartley (Bf & Br).Youngsville, Warren
Geo. G. Strosnider (Br)..Waynesburg, Greene
B. L. Post's Sons (RCB).W.Alexander, Wash.
H. C. Bughman (Br)...Greensburg, Westm'd
Nelson Bros. (C B).....Grove City, Mercer
Pa. State College SCW)..State College, Cent'r
R. S. Love (& W)...Mt. Pleasant, Westm'ld
W. F. Holtzer (Wh)....Greensburg, Westm'ld

BANTAMS.

H. C. Bughman..Greensburg, Westmoreland
W. A. McCoy (WhG).....Mercer, Mercer
R. F. Shannon (BBRGame)..Edgeworth Sta.,
.....Allegheny
R. S. Hartley (Bf Coch)..Youngsville, Warren
E. B. Boyle.....Canonsburg, Washington

GAMES

Pa. State College.....State College, Center
R. F. Shannon....Edgeworth Sta., Allegheny

FAVEROLLES.

Pa. State College.....State College, Center

PEAFOWLS.

J. C. Andrews.....Mattie, Bedford
W. A. McCoy & Sons.....Mercer, Mercer
D. W. Jones.....Wilmore, Cambria

GUINEAS.

R. S. Nicholson & Sons.....Kittanning, Arm'g
W. A. McCoy & Sons (Wh)....Mercer, Mercer

FERRETS.

Nelson Bros.....Grove City, Mercer

DUCKS.

G. I. Fugate (Mus).....Ellsworth, Wash.
Benj. McKeehan (Pekin)..Mt. Rock, Cumb'd
W. H. Gray (Pekin).....Brookville, Jefferson
W. A. McCoy & Sons.....Mercer, Mercer

TURKEYS.

Jno. M. Berry (WhH).....Wylandville, Wash.
B. L. Post's Sons (MB).....Claysville, Wash.
A. G. Shaffer.....Rural Valley, Armstrong
D. N. App (WHol).....Selinsgrove, Snyder
W. H. Gray (Br).....Brookville, Jefferson
B. F. Jones (Bl).....South Montrose, Susq.
J. L. Stouffer (Br)...Southwest, Westmorel'd
Clarence M. Glasgow (Br)..Calvin, Hunting'n
Henry H. Randt.....Pipersville, Bucks
J. B. Wylie (WH)..Washington, Washington
W. A. McCoy & Sons (WH). Mercer, Mercer
D. W. Jones.....Wilmore, Cambria

WHITE-TIPPED BLACK SPANISH.

Pa. State College.....State College, Center

GEESE.

W. J. Monroe (Tou).....Greensburg, Pa.
W. H. Gray (Tou).....Brookville, Jefferson
W. A. McCoy & Sons (Emb)...Mercer, Mercer

BUCKEYE REDS.

J. H. Peachy.....Belleville, Mifflin

BLUE SPANISH.

G. T. Fugate.....Ellsworth, Washington

DOGS.

SCOTCH COLLIES.

Austin Leonard & Son.....Troy, Bradford
Clarence M. Glasgow.....Calvin, Huntingdon
J. C. Andrews.....Mattie, Bedford
Nelson Bros.....Grove City, Mercer
D. W. Jones.....Wilmore, Cambria
Benj. McKeehan.....Mt. Rock, Cumberland
M. P. Shoemaker & Bro..Greensburg, West.
W. H. Gray.....Brookville, Jefferson
H. M. Lyon & Sons.....Wyalusing, Bradford
R. S. Hartley.....Youngsville, Warren
J. I. Barley.....Baker's Summit, Bedford
F. B. Stewart.....Espyville, Crawford
Nelson Bros.....Grove City, Mercer
T. M. McKee.....Lewistown, Mifflin

SCOTCH TERRIERS.

R. F. Shannon.....Pittsburg, Allegheny

BULL TERRIERS.

W. C. Norton.....Waymart, Wayne

ENGLISH SHEEP DOGS.

Benj. McKeehan.....Mt. Rock, Cumberland

FOX HOUNDS.

Willis W. Hopkins.....Aldenville, Wayne

BEAGLES.

J. F. Lantz & Co.....Glenmoore, Chester

ANGORA CATS.

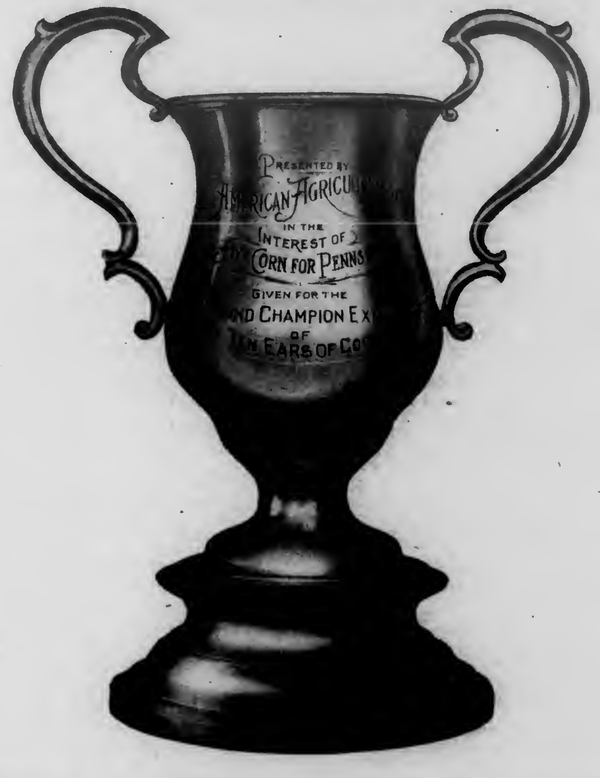
E. L. & Sidney Roberts.....Malvern, Chester

The Grange Exhibit Trophy.

The above splendid Silver Cup was donated by the National Stockman and Farmer, Pittsburgh, Pa., for the best exhibit of fifty ears of corn by a

SUBORDINATE GRANGE

The Grand Champion Trophy.



The above splendid Silver Cup was donated by the American Agriculturist, New York, New York, for the

GRAND CHAMPIONSHIP

Best Ten Ears of Corn in the 1909 Show

Pennsylvania's Third Annual Corn Show.

Third Annual Corn Show held by the Pennsylvania Live Stock Breeders' Association at its Annual Meeting, Chestnut Street Hall, Harrisburg, Pa., Jan. 26-29, 1909, with Penn'a Dairy Union and Penn'a State Board of Agriculture.

CLASSES:

CLASS A—Yellow Dent—For the best exhibit of Yellow Dent corn, consisting of ten ears: 1st prize, $25 Silver Cup donated by **Dr. Thos. Turnbull,** Pittsburgh, Pa.; 2d prize, $7.50; 3d prize, $5; 4th prize, $3; 5th, 6th, 7th, 8th, 9th and 10th prizes, $1 each.

CLASS B—White Capped Yellow Dent—For the best exhibit of White Capped Yellow Dent corn, consisting of ten ears: 1st prize, $25 Silver Cup donated by **Faculty of Penn'a Agricultural College,** State College, Pa.; 2d prize, $7.50; 3d prize, $5; 4th prize, $3; 5th, 6th, 7th, 8th, 9th and 10th prizes, $1 each.

CLASS C—White Dent—For the best exhibit of White Dent corn, consisting of ten ears: 1st prize, $25 Silver Cup donated by the **Faculty of the Veterinary College of the University of Pennsylvania,** Philadelphia, Pa.; 2d prize, $7.50; 3d prize, $5; 4th prize, $3; 5th, 6th, 7th, 8th, 9th and 10th prizes, $1 each.

CLASS D—Ninety-Day Type—For the best exhibit of Ninety-Day Type of corn, consisting of ten ears: 1st prize, $25 Silver Cup donated by **Department of Agriculture,** Harrisburg, Pa.; 2d prize, $7.50; 3d prize, $5; 4th prize, $3; 5th, 6th, 7th, 8th, 9th and 10th prizes, $1 each.

CLASS E—Flint—For the best exhibit of Flint corn, consisting of ten ears: 1st prize, $25 Silver Cup donated by **Hon. Vance C. McCormick,** Harrisburg, Pa.; 2d prize, $5; 3d prize, $3; 4th prize, $2; 5th, 6th, 7th, 8th, 9th and 10th prizes, $1 each.

CLASS G—Grange Exhibits—For the best fifty ears of corn, any variety or type, exhibited by a Subordinate Grange, a $50 Silver Cup donated by **The National Stockman and Farmer,** Pittsburgh, Pa.; 2d prize, a $25 Silver Cup donated by **Hon. Vance C. McCormick,** Harrisburg, Pa.

Grand Championship—For the best ten ears of corn in the Show, a $50 Silver Cup donated by **The American Agriculturist,** New York, N. Y.

Champion Ear—For the best ear of corn in the Show, Silver Plate donated by **R. F. Shannon,** breeder of Jersey cattle, Pittsburgh, Pa.

RULES.

The following regulations shall govern the contest:

Each exhibit shall consist of ten ears of corn, except Subordinate Grange exhibits, which shall consist of fifty ears.

The corn in the Grange exhibits may be furnished by any or all members of the Grange which enters the exhibit.

No individual exhibitor may enter more than 10 ears in the same class.

The Champion Ear may be selected from any exhibit; the Champion ten ears from any class except the Grange exhibits.

Competition is limited to corn-growers of Pennsylvania. No seedsman or employe of a seedsman will be allowed to compete.

All corn shown must have been grown by exhibitor in Pennsylvania in 1908.

It is impossible to return corn or packages, and all corn shown will become the property of the Pennsylvania Live Stock Breeders' Association.

No entrance or other fees will be charged. Everything is free.

Unclassified corn will be classified by the judges. Exhibitors are requested to fill out **entry blanks** which will be furnished on application to E. S. Bayard, East End, Pittsburg, Pa.

The corn will be judged by Dr. Thos. F. Hunt, Dean of Pennsylvania College of Agriculture, and Prof. F. D. Gardner, Agronomist Pennsylvania Experiment Station. There shall be no appeal from any decision rendered by these judges.

All corn must be consigned to W. H. Moody, Chestnut Street Hall, Harrisburg, Pa., and must be in his hands by Monday, January 25. All charges must be prepaid by the shipper.

Every exhibitor must place on the **inside** of package containing his corn an entry blank or a card giving his **name** and **address.** This card will be removed and a number substituted until the judging is completed.

The corn will be judged on Tuesday, January 26, and no entries can be accepted after **Monday evening, January 25.**

Exhibitors must keep all marks of identity off exhibits until judging is completed.

All cups become the absolute property of the winners.

Little Giant Stock Food-Tonic

Composed of

Sterilized Meat-Meal
Sterilized Bone-Flour
Sterilized Ground-Blood
C. P. Charcoal
Imported German Fennel Seed
Imported French Gentian Root
Imported African Fenugreek Seed
Imported Spanish Licorice Root

GUARANTEED ANALYSIS

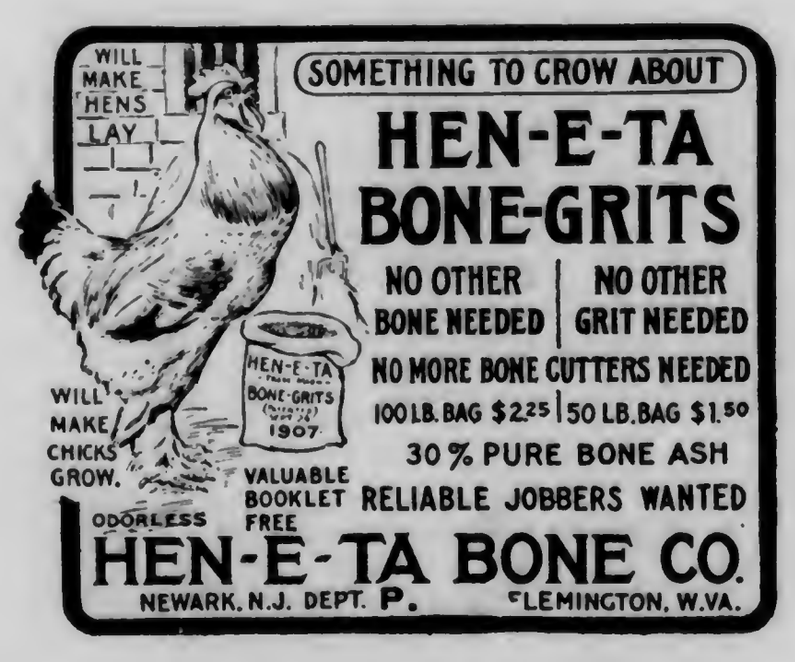
Crude Protein - - -	28 per ct.
Crude Fat - - - - -	12 "
Crude Fibre* - - - -	15 "
Phosphorus - - - -	4 "
Calcic Phosphate - - -	22 "

*Fibre from meat-meal and roots only; no grain chaff, middlings, screenings or other "filler" of any kind used in this food-tonic.

Made by

LITTLE GIANT FOOD COMPANY

NEWARK, N. J.



ASK OR WRITE

J. F. LANTZ

WYEBROOKE, PA.

—FOR—

PRICES AND TERMS

ON

"Little Giant" Stock Food

AND

"Hen-e-ta" Bone Grits

END OF YEAR